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FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

FIRST AERONAUTICAL WEEKLY IN THE WORLD : FOUNDED 1909

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The Fleet Air Arm

FROM the remarks of Sir Thomas Inskip, Sir Samuel Hoare and the Prime Minister during the debate on the Address, it is clear that the control of the Fleet Air Arm is now once again under review. For some time past whenever this question has been mentioned the questioners have been referred to the decisions of previous committees which have reported on the subject. This time there has been no such abrupt treatment of the question, and it may therefore be anticipated that some change is in contemplation.

In the past *Flight* has, generally speaking, supported the principle that all flying, and particularly all war flying, should be under the control of the Air Ministry, partly because all Service flying was in a more or less experimental state and so would benefit by the amalgamation. With the great expansion of both Navy and Air Force which is now taking place it is possible that a change in control may be wise. We need no longer think primarily of the interests of flying as a cause for which martyrs should go to the stake, or of the safety of the Air Ministry. Neither now needs championing. The defence of the country must henceforth be the chief and only consideration, and if the interests of defence call for a change, then that change must be accepted.

The case for making a change is briefly this: It is an accepted maxim of all fighting Services that dual control is bad, and is liable to lead to disaster. At present the Fleet Air Arm suffers from dual control in respect of both personnel and material.

Some dozen years ago or more a Government committee (the Balfour Committee, if we remember right) decided that all the observers in aircraft of the Fleet Air Arm should be naval officers; that 70 per cent. of the pilots should also be naval officers but should, while serving in the F.A.A., receive commissions from the Air Ministry; that the Admiralty should pay for practically all the cost of the F.A.A.; and that neither units nor personnel should be withdrawn from the F.A.A. by the Air Ministry without the consent of the Admiralty.

The position, therefore, on an aircraft carrier is this: in a three-seater spotter reconnaissance machine the observer is a naval officer, the pilot is usually a naval officer with a temporary R.A.F. commission, though sometimes he is an Air Force officer pure and simple, and the air gunner is a naval rating. The rigger and fitter who maintain the machine are airmen of the R.A.F., while the aircrafthand who cleans it is usually a naval rating. On each carrier there is a Wing Commander who is in charge of all flying, but when afloat the whole of the F.A.A. is under the command of the naval authorities for operations. When ashore the units are under the command of the Air Ministry.

An Unsound System

There are occasional exceptions to the above rules. The old T.A.G. (telegraphist air gunner) is being superseded by a new rating called observer's mate. A very few sergeant pilots of the R.A.F. have been posted to the F.A.A., which has made it seem more invidious that there have been no petty officer pilots. Another anomaly is that when a squadron goes ashore it is usually accompanied by one observer, who, not having a commission in the Air Force, has no authority to control R.A.F. personnel and is not subject to Air Ministry orders. This, however, has not caused any difficulties. In fact, by dint of good will on both sides, the curious system of dual control outlined above has worked with reasonable smoothness. The personnel of both Services on a carrier undoubtedly get on together most harmoniously, although the R.A.F. pilots do only flying duties, while the naval personnel have to do ship's work as well as flying duties. Still, a system which is essentially unsound does not become less unsound because it

has been made to work by the good will of individuals. In the stress of war unsound systems of dual control are apt to break down, with deplorable results to the country.

It is obvious from the above that of the original hawser which bound the Fleet Air Arm to the Royal Air Force only a few strands remain. It would be no great matter to break those few strands. It only means withdrawing 30 per cent. of the pilots, the riggers and the fitters, and putting them on to other R.A.F. duties, while their places would be taken by an equal number of naval personnel. The Admiralty's payments for the F.A.A. would appear in the Admiralty Estimates instead of figuring in the Air Estimates as an appropriation-in-aid. Doubtless there would need to be a few minor adjustments, but nothing of any consequence.

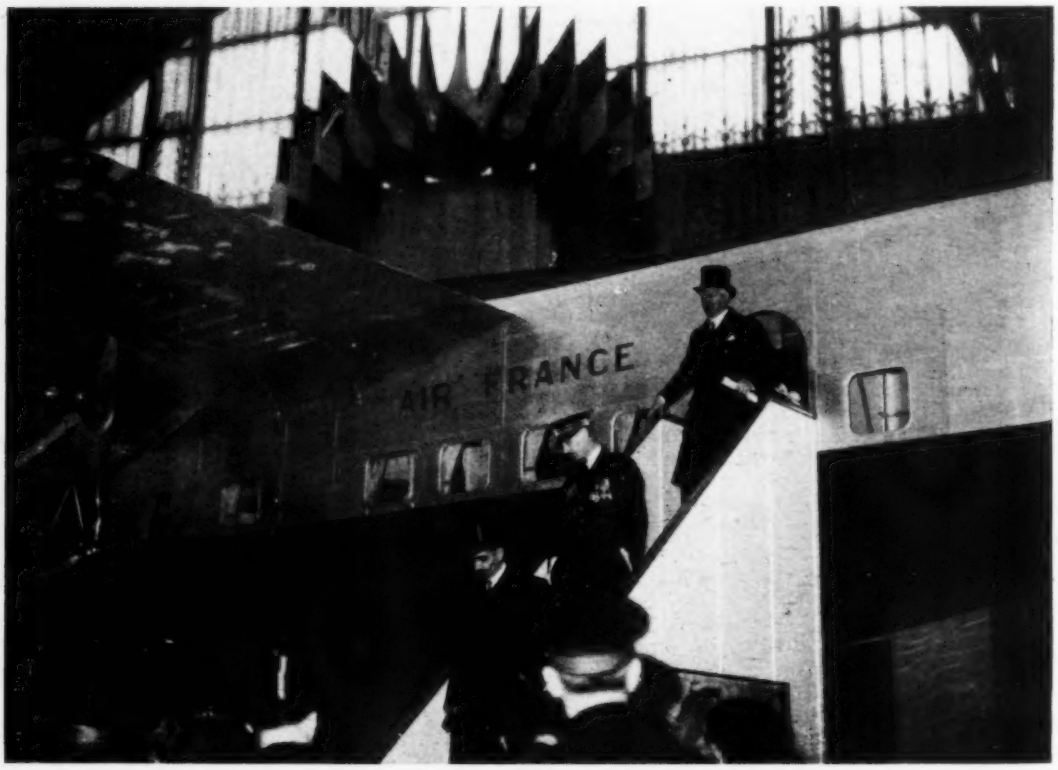
Safeguards

There always are a few inconveniences when any change in organisation is undertaken, and perhaps some danger of new mistakes. It would be wise to consider in advance some rules to minimise the chance of future mistakes. After making the change it must be borne always in mind that the Fleet Air Arm would only be an arm of the Navy, much as submarines are, whereas the Royal Air Force would remain a Service on the same footing with the Army and the Navy. For the sake of economy and common sense it should be laid down that the Air Ministry must remain the sole source of aircraft supply, and that all orders for naval aircraft must be placed through the Air Ministry as they are at present. There must be no competition for orders as in the bad old days before April 1, 1918.

Likewise economy and common sense dictate that there should be only one set of *ab initio* flying training schools for all the Services, and that they should be managed by the Air Ministry as at present. The special School of Naval Co-operation should be taken over by the Admiralty and charged to the Estimates of that Ministry. It would also be extravagant and foolish to permit duplication of aeronautical research. Some people anticipate that the Admiralty would want to set up its own edition of Farnborough, and perhaps its own edition of the National Physical Laboratory. Naval aircraft may have some special needs for which the Admiralty would want special research undertaken, but the principle should be laid down that all research work will be pooled, and that the Air Ministry should be responsible for it. It is for the Cabinet to guard against breaches of that principle.

Once the Admiralty is in complete control of all officers, men, and machines on its ships, we may anticipate with confidence that the old antagonism between it and the Air Ministry will die away for want of fuel to feed the flames. Hitherto the Fleet Air Arm has been like a salient in the Air Ministry trench line, always inviting attacks. Let that salient be evacuated, and the line will gain in strength.

If the Admiralty gains its point on this occasion, it must be anticipated that in due course the War Office will make a similar demand for its own Air Arm. If the arrangement made now with the Admiralty is on sound lines there will be a precedent for dealing with a similar claim by the War Office. In that case the War Office would, of course, bear the cost of its squadrons and of the School of Army Co-operation.



THE OPENING: M. Albert Lebrun, President of the French Republic, leaves the cabin of the big Farman 224 during his tour of inspection following the official opening.

The Outlook

A Running Commentary on Air Topics

Mr. Churchill's Attack

FROM those far-off days when Mr. Churchill admitted that a certain electioneering statement was "terminologically inexact," he has always been an amusing coiner of phrases. In the debate on defence the other day his charge that the Government were "decided only to be undecided, resolved to be irresolute, adamant for drift, solid for fluidity, all-powerful but impotent," will live as one of the parliamentary episodes which make for the gaiety of nations.

For the rest, his attack on the Government was largely pushing at an open door. The years in which Britain let her armaments dwindle to the point of danger represented two policies, the setting of an example in disarmament and an economy in lean times when the Foreign Office held that there was no likelihood of immediate danger. Whether the policy followed was excusable or not, those days are now past and the Government is rearming with all possible energy. It appears from the debate that, so far as the air is concerned, the production of engines is ahead of the programme, while that of aeroplanes is somewhat behindhand, and the formation of new squadrons is rather more seriously in arrears.

It should be remembered that the starting of mass production is apt to be slow. Works have to be adapted for the new process, but once it is started the pace increases rapidly. The organisation of the Handley Page works at Cricklewood was shown to a party of visitors the other day, and may be taken as typical of what is now going on throughout the industry. Once jigs are ready, aeroplanes appear in rapid succession.

New Squadrons

AS regards the formation of new squadrons, Mr. Churchill pointed out that in thirty-two weeks we had formed twenty-eight new squadrons, and that in the next twenty weeks we should have to form forty-three more to keep up to the programme. It will certainly be very creditable if those arrears can be made up. Probably not nearly enough consideration has been given to the delays caused by the despatch of a number of squadrons to the Mediterranean area last summer. The usual method of forming a new squadron is to take one flight from an existing squadron and build up round it. Obviously, the squadrons which had been sent overseas could not be used as parents; but now that they have come back, the rate of new formations ought to be rapidly increased. In fact, the present was not an appropriate time for accusing the Government of apathy.

Foreign Aircraft on a British Line

IT would be hard measure to blame British Airways for wanting to get on with their job, and to put their service to Scandinavia into order with the minimum of delay; just as it would be severe to blame General Aircraft for installing American engines in their Croydon aeroplanes after having failed to secure prompt delivery of British engines. It is, however, a very serious matter that the Air Ministry should have agreed to let a subsidised British air line use foreign machines. On the grounds of public interest it would have been far better to accept a delay of a few months in getting the service into full working order. At the worst, permission might have been given to British Airways to buy a few Lockheed Electras to tide them over until British machines were available, insisting that when these were ready they should be used on all subsidised flights. This decision of the Air Ministry is sure to have very harmful effects in Australia and other parts of the Empire where there are parties in favour of foreign aircraft.

Hasten Slowly

SIR ERIC GEDDES' speech (read by Sir George Beharrell) at the annual general meeting of Imperial Airways had little that was new to say about high policy, but contained a number of interesting facts and observations. It is very interesting to know that the average journey of a single passenger on the Empire services is 2,025 miles. It is positively intriguing to learn that every pound of weight added to pay load has an earning value of about £12 per annum. This fact was disclosed in connection with remarks about the chairs in the big flying boats. The Pan-American chair weighs 35 lb., while the Imperial Airways chair weighs only 18 lb. It follows that on each chair, whether occupied or not, Imperial Airways earns £240 per annum more than Pan-American can earn. Multiply that by all the chairs in all the machines in the fleets of the two companies, and the result would be astonishing.

It is not at all surprising to learn that a large proportion of passengers does not wish to be rushed over continents at great speed. They want to stop and see the interesting places on the way. That is natural, but it seems rather to invalidate the idea that the great thing is to reduce the time of the journey by flying faster and ever faster. But the remainder of the passengers will want to get to the terminus quickly, and the mails certainly need the fastest possible transport. Even the sight-seeing passengers want to spend as little time as possible in the air and as much as they can on the ground. Nearly every passenger claims that he loves flying, but he does not want it in too large doses at one time.

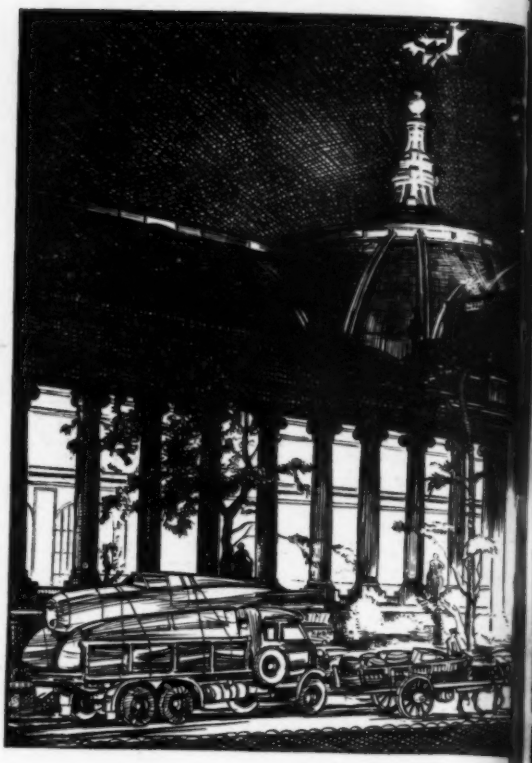
Australia's Terms

A PENALTY clause for late arrivals ought to be embodied in all mail contracts, and if, as is anticipated, the Commonwealth Government insists on one in the terms for the through Empire route from England to Sydney, no objections can be taken. Slow and sure mail deliveries are preferable to irregular fast ones, and mail aircraft must make certain of arriving on time, except in very unusual circumstances. The anticipated Australian stipulation that the Commonwealth shall be able to withdraw if dissatisfied with the service, thus briefly expressed, seem high-handed, but the actual terms may prove to be more reasonable.

Most serious of all is Australia's reported insistence on a mail surcharge of 6d. the half ounce. That strikes at the whole base of the plan, for it leaves to the individual letter-writer the choice of sending his letter by air or by sea. The Home Government's plan of sending *all* letters by air at 1½d. the half ounce embodies a far-sighted policy of drawing the various Empire countries closer together. It would be deplorable to see this proposal definitely negatived.

THE PARIS A

Interesting Military Developments Preponderate : A Paucity of Large Commercial Types : Trend Towards the Use of Inverted Vee Engines : The Biplane all but Disappears



THAT military aircraft types preponderate at the Fifteenth International Aero Exhibition which opened in Paris last Friday is the first impression after a tour of the Grand Palais des Champs Elysees. The impression is undoubtedly justified from a point of view of sheer importance, although on a basis of actual numbers of aircraft types, the civil side "has it." Many of the civil machines are, however, of very small significance. For once, the seaplane is all but absent except for models and pictures, a fact which it is interesting to record, but which does not necessarily indicate any particular trend.

Quality, not Quantity

That British aviation should be represented by but a single machine is to be regretted, although the excellence of the Bristol Blenheim does much to redress the balance of British prestige among the more discriminating visitors to the show. That the British Air Ministry withdrew permission to exhibit the Hawker Hurricane is a pity, and the interest with which visitors to the stand examined the *Flight* photographs of the machine is an indication of the attention it would have attracted had it been shown.

British aero engines were very worthily represented by Armstrong Siddeley, Bristol, Cirrus-Hermes, and Rolls-Royce, whose products compare well with anything exhibited by other nations. In the galleries a considerable number of British firms show what Great Britain has to offer in the way of accessories, instruments and equipment.

From a structural point of view, it can be said that all-metal construction now is the general rule. Mr. H. J. Pollard will write in next week's issue an article on his impressions of the forms of metal construction employed by the different manufacturers, but in the meantime it may be recorded here that light metals are used extensively, steel being very little in evidence except for certain highly stressed fittings and parts.

In the matter of aerodynamic design, the twin-engined monoplane is the accepted type for a great many classes of military aircraft, even some fighters

Britain to the Fore : The first machine is the Bristol Blenheim bomber. Behind it is seen the Amiot high-speed, all-metal mail-plane.

S AERO SHOW

THE Fifteenth International Paris Aero Exhibition at the Grand Palais remains open until Sunday week, November 29. In the following pages the exhibits are described under "Military" and "Civil" headings, and on page 561 engine exhibits are briefly dealt with; in next week's issue of "Flight" the engines will be described in detail, and there will also be notes on the British and Continental accessory and component exhibits.

been tried before, but this is the first time both features have been used together and combined with a triangular fuselage cross-section.

There is a rather noticeable absence of large commercial aircraft types at the show, the only exponent *en vrai grandeur* being the four-engined Farman F.224. Probably no particular significance is to be read into this scarcity of large types; it has just happened that no firm had a large machine ready in time for the show.

Of the medium-size commercial aeroplanes shown, the two most interesting are the Russian A.N.T.35, which shows that Russia has been making real solid progress technically during the last couple of years, and the Amiot mailplane, a very beautiful mid-wing monoplane.

Civil and military aviation meet in several new machines at the show. That is to say, racing influence is quite obvious in a good many cases. For instance, the introduction of inverted vee engines in such machines as the Mureaux fighter has produced a type which, although carrying military equipment and obtaining a remarkably high performance, does so with a relatively modest expenditure of power. The lessons of the Coupe Deutsch race have not been missed by French military aircraft designers.

Judging from the engines fitted in the different aeroplanes exhibited, the air-cooled has all but ousted the water-cooled engine in civil aircraft. In military aircraft also the air-cooled is far and away in the majority, but this is probably of less significance than might be imagined, and may be due to the absence from the show of a number of French fighters which are fitted with water-cooled engines.

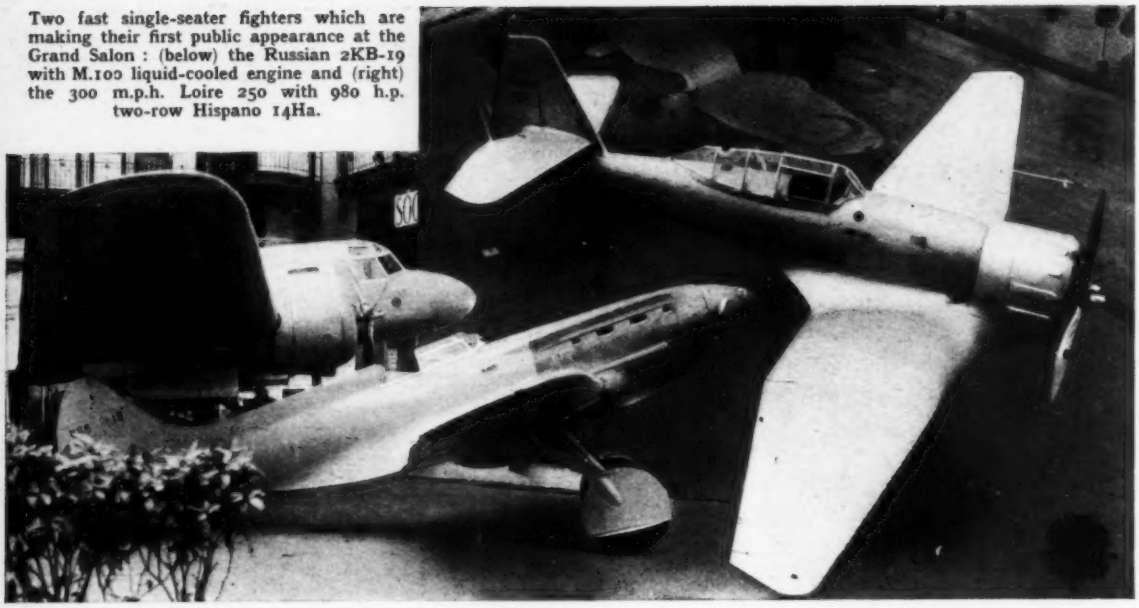
The absence from the Paris Show of Germany and Italy is greatly felt, but, in spite of this, "The Fifteenth" is quite an interesting and instructive exhibition.

being included. In the main, the "classic formula" of low-wing cantilever monoplane with engines on the leading edge and wheels retracting into the engine nacelles is adopted, but the mid-wing arrangement appears to be making some headway, notably in military types, which require stowage space for bomb loads and the like.

Curiously enough, it remained for the two Dutch constructors, Fokker and Koolhoven, to introduce the only two real novelties in military aircraft design. The Fokker, with its twin fuselage type tail-carrying booms, has got away from the blind spot under the tail, but in doing so it seems to have run into a blind spot on each side.

Koolhoven's design is certainly ingenious, and it is refreshing to see a designer of long experience breaking new ground in this manner. An engine in the middle of the fuselage has been tried before; two co-axial airscrews running in opposite directions have

The only really large commercial aeroplane in the Show, the Farman 224 carries 40 passengers and a crew of four. In the foreground is the Mureaux 190 C.1 fighter.



Two fast single-seater fighters which are making their first public appearance at the Grand Salon : (below) the Russian 2KB-19 with M.100 liquid-cooled engine and (right) the 300 m.p.h. Loire 250 with 980 h.p. two-row Hispano 14Ha.

MILITARY TYPES at the SHOW

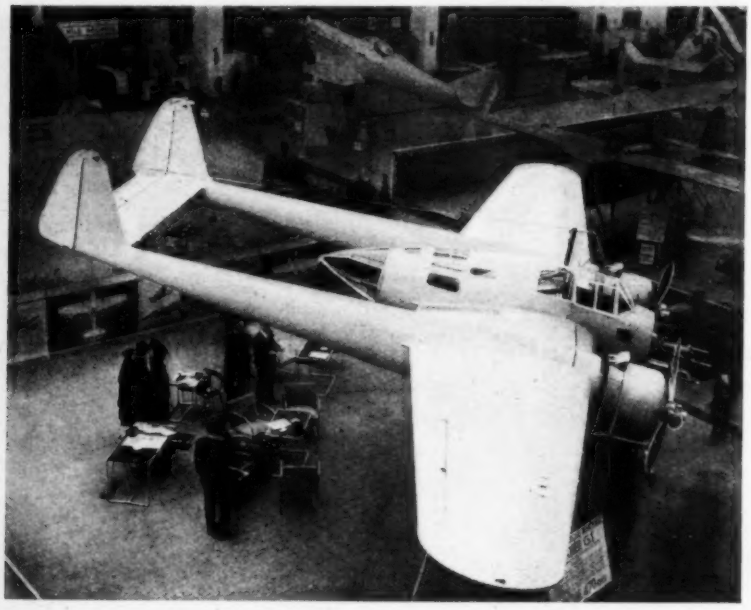
Single and Multi-seaters Capable of 300 m.p.h.

Illustrated with "Flight" Photographs and Sketches

HIGH-SPEED, twin-engined monoplanes of comparatively small size are well represented at Paris this year, and are arousing the most sanguine of hopes among tacticians and constructors. Happily, Great Britain's sole militant exhibit, the Bristol Blenheim medium bomber, falls into this category, and makes an excellent showing in comparison with the Continental models, although the lack of even approximate performance figures such as are issued for the foreign types results inevitably in a certain amount of scepticism about speed and range.

The single-seater group provides plenty of material for study, particularly the outlandish Koolhoven and the diminutive Mureaux.

The predominance of military machines, of course, has an obvious significance, but fear and regret must be tempered with admiration for the great technical advances made in design and construction.



Designed for fighting, attack, bombing and reconnaissance work, the Fokker G.1 *Le Faucheur* (which, being interpreted, might be *The Grim Reaper*) is estimated to do 292 m.p.h. with Bristol Mercury VIIs. It carries two Madsen canons and three machine guns, which should make very effective sickles in a ground strafe.

Single Seater Fighters

The absence of our own Hawker Hurricane is generally deplored, particularly in view of the fact that Great Britain is credited with the most advanced fighter types now in the air. But Continental inquirers are able to study the exterior of the machine (and even had it been present internal inspection would most likely have been banned) from a magnificent *Flight* photograph. A bi-lingual notice explains that the British Air Ministry, "reluctantly, and at the last moment," withdrew permission for its exhibition. Structural specimens and a range of photographs of the ubiquitous Hawker biplane types keep the Hawker stand well populated.

Considered purely as a design the Koolhoven F.K.55 is the most stimulating of the fighters, the remainder being made up of two high-gull-wing monoplanes (both *pluricanon* machines) and four low-wing types of more or less conventional layout.

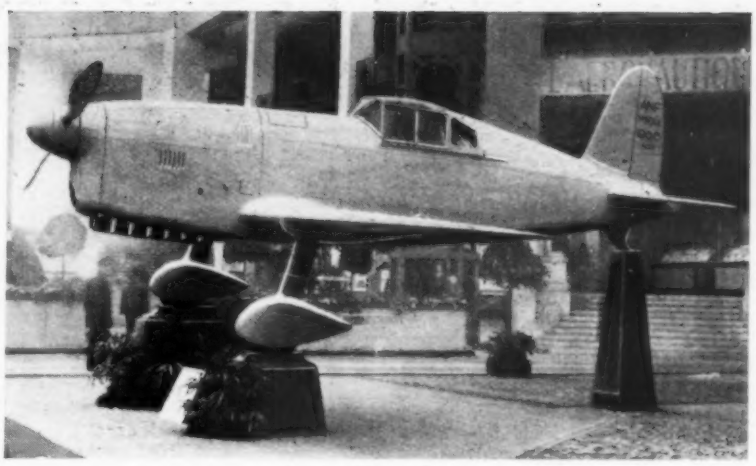
Powered with one of the latest Lorraine Petrels, the 12 Hars, giving 860 h.p. at 13,120ft., the machine is said to be capable of 323 m.p.h. and of climbing to 13,120 ft. in 4 min. 12 sec. The landing speed is just over 60 m.p.h.,

which seems reasonable for a wing loading of rather more than 23 lb./sq. ft.

The Petrel engine is mounted in the fuselage between the spars of the wing and approximately on the centre of gravity, cooling "gills" being provided in the fuselage sides. Two airscrews are fitted, revolving in opposite directions and being driven through a shaft and gear box.

Mr. Koolhoven claims that the view obtainable by the pilot from his cockpit forward of the wing is superior to that permitted by any existing fighter design. The cockpit is covered by a quickly releasable hood.

Structurally, the machine seems fairly conventional, the centre section of the wing being built integral with the fuselage. Wooden spars, three-ply ribs and stressed three-ply skin feature in the outer wing panels. Doubtless the wings, which, due to the elimination of torque by the twin airscrews, can be fitted with an unconventional form of lateral control, are very stiff torsionally owing to their low aspect ratio. Their inboard sections and the sloping sides of the triangular sectioned fuselage are used to house the retractable undercarriage.



The Mureaux 190 single-seater fighter represents a widely advocated class, being a small light machine with an engine of comparatively small capacity (450 h.p.), but carrying a *canon*, two machine guns and wireless while retaining an excellent performance.

Armament

A *canon* is mounted in front of the pilot, firing out through the airscrew shaft, and there is a pair of machine guns in the wings shooting clear of the airscrew arc.

Enquiries relative to the lateral control are not welcome, but it seems that there are span-wise recesses in the wing (covered over at Paris) containing slotted rotating cylinders.

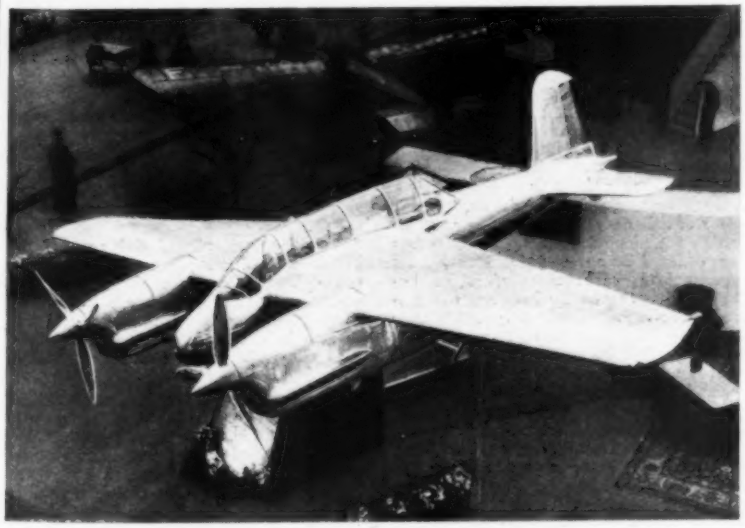
Few people know that this is the third Koolhoven fighter built to such a formula; the first production machine should be in the air by February.

Next in order of interest comes the little Mureaux 190 C.1 with an inverted vee-twelve air-cooled fourteen-litre Salmson of 450 h.p. The airscrew shaft of this engine is geared up, permitting a *canon* to be mounted above the crank case, whence it fires through the shaft. There are, in addition, two outboard rifle-calibre machine guns.

The all-up weight of this interesting little metal-clad monoplane is only 2,843 lb. when carrying its full equipment and fuel sufficient for a two-and-a-half hours' endurance. At about 13,000ft. the maximum speed is said to be 304-310 m.p.h.

One gathered that it is an "aerobat" of the first order, that the turning circle puts its bigger and heavier brothers to shame, and that the landing speed is about 60 m.p.h.

Considering that three guns, two-way radio and all the usual fighting equipment is specified, that the engine is of such a low power, and that the handling qualities are of such a high order this machine seems to justify the confidence placed by a large section of French experts in the light "jockey" fighter and augurs well for the success of our own Vickers Venom.



The most unconventional of the striking twin-engined fighting machines is the Hanriot 220, mounting a pair of 450 h.p. inverted-vee Renaults. It is claimed to do 310 m.p.h. with a pair of the new Gnome Rhône 14M 650 h.p. small-diameter radials.

Two larger, heavier and higher powered machines in the 300 m.p.h. category are the Loire-Nieuport 250 and the Morane-Saulnier 405. The last-named machine has been adopted as standard equipment and is exhibited on the official stand of the French Air Ministry.

The Loire is fitted with one of the new Hispano Suiza 14Ha two-row, fourteen-cylinder radials of 980 h.p. and is a low-wing cantilever monoplane with a wing of peculiar formation. The centre section is proportionately wider than usual and is given no dihedral, this being reserved for the outer panels. The undercarriage retracts in an inward sense into the wing which carries trailing-edge flaps designed to keep the landing speed down to 62 m.p.h. in spite of the wing loading of over 30 lb./sq ft.

The fuselage behind the big Hispano radial is of circular section as far back as the pilot's cockpit thence developing an oval section.

The cockpit enclosure is of more than usual interest because its tail fairing is quite transparent to improve the field of view.

Full night-flying gear is specified, together with two-way wireless, two *canons* mounted in the wings and two machine guns.

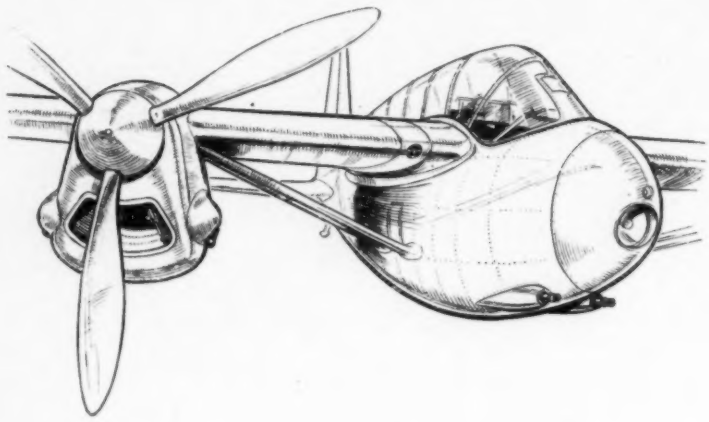
A three-bladed Hispano-Suiza airscrew is fitted, being a Hamilton type built under licence in France. In round figures the maximum speed is given as 300 m.p.h. and the time of climb to 13,120 ft. as five minutes.

The Morane Fighter

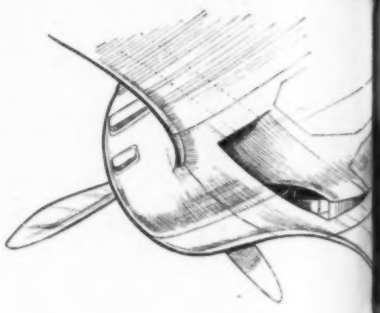
The Morane-Saulnier 405, one gathers, is about the most successful machine of the last batch of fighters submitted to the French Air Ministry for competitive tests, although judging from its external appearance it is a good many m.p.h. slower than our Spitfire or Hurricane. Even were it so clean aerodynamically as either of those types its performance would be inferior for its Hispano Suiza

A MILITAR

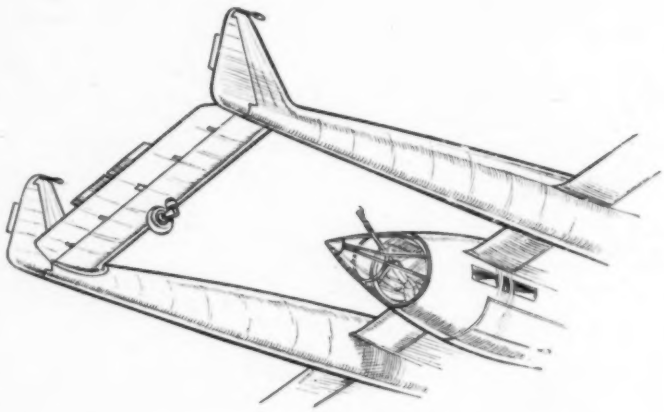
Points of Interest



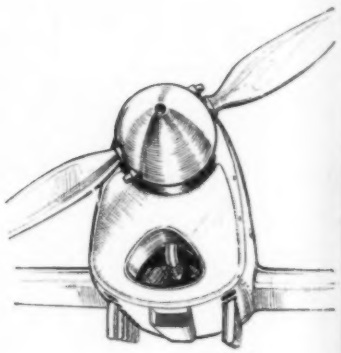
The installation of the inverted-vee Renaults in the new Hanriot 220. Note also the bracing arrangements and the cockpit enclosure.



The cowling of the Loire 250 fighter merges into the wing and fuselage as shown above. Below is a sketch of the nose of the new Mureaux 190 fighter, showing the method of admitting cooling air to the 450 h.p. inverted Salmson *canon* engine.



The tail of the Fokker G.1. The booms are of metal construction.



12Ygrs delivers only 860 h.p. as against the 1,000-odd of our Merlin.

Nevertheless it has some interesting features. Basically it is a low-winged cantilever monoplane of metal construction, with metal and fabric covering, embodying flaps and a retractable undercarriage the wheels of which are sharply toed outward when in their down position. The air-heated cockpit enclosure is of fairly conventional design.

The Hispano engine carries a 20 mm. *canon* which fires through the airscrew shaft, and two rifle-calibre machine guns are fitted outboard in the wings, where they are fired and loaded pneumatically.

The U.S.S.R. presents one of its high-speed stressed-skin fighters of which we have heard so much but seen so little. With the designation 2KB-19, it mounts an M.100 liquid-cooled engine and is somewhat reminiscent in general appearance of a Spitfire. Its ground angle seems abnormally large but, all things considered, the machine seems quite a sound design. Four wing guns are fitted, there being four normal triggers on the spade grip of the control column. The laterally retracting undercarriage makes a backward movement during retraction, presumably to clear the main structural members. A retractable radiator is mounted under each wing.

Although it cannot be considered a thoroughly modern type, the D.510, the sole Dewoitine exhibit, is of interest to British visitors because an example has been ordered by our own Air Ministry for experimental work, mainly, it its believed, with the *canon* between the cylinder banks of the 860 h.p. Hispano Suiza 12Y engine. The machine on show is equipped with the new type of exhaust system which seems to be coming into general use on liquid-cooled Hispanos. This takes the form of flat pipes curving vertically downward from the ports and braced to the fuselage. Each pipe is split down its centre to permit the escape of the gases.

Bought by Britain

The D.510, of course, is a low-wing cantilever monoplane of all-metal construction fitted with a fixed divided undercarriage and mounting no flaps. The latest Dewoitine development is the D.513 which has flaps and a retractable undercarriage, and is generally cleaner than its forerunner, particularly in its radiator installation. A speed of about 300 m.p.h. is claimed, which is something like 50 m.p.h. faster than for the D.510.

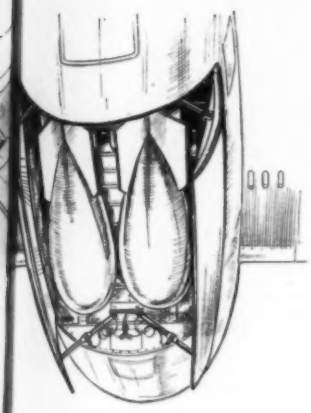
The two gull-winged fighters are the Polish P.Z.L. P.24 which appeared in the Grand Salon two years ago, but which, since that time, has been adopted in quite considerable numbers, and the French Loire 46 which has been the subject of a production order from the French Air Ministry.

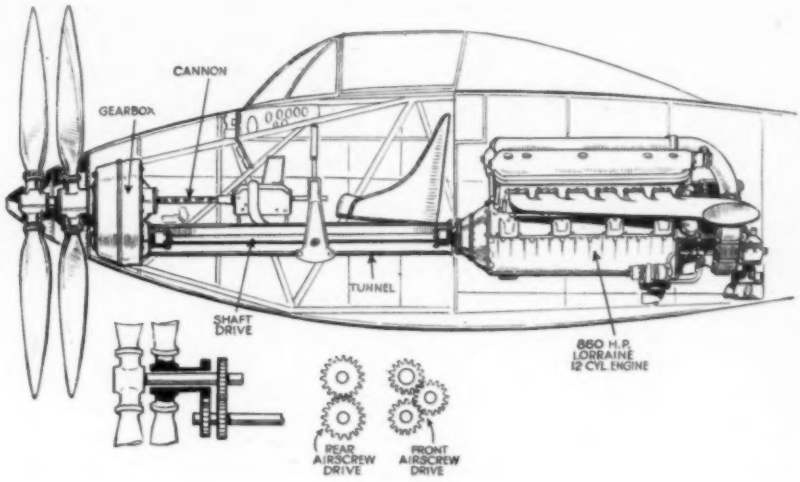
Turkey has ordered sixty P.Z.L. P.24's, Greece is having forty and Roumania ten, in addition to her 110 P.11's in service. The standard power plant is the Gnome Rhone 14 Kfs of 900 h.p., which gives a maximum speed of 267 m.p.h. at 14,000 ft. Two Oerlikon "FF" *canons* are carried in the wings and a pair of machine guns can be mounted in the fuselage. Provision is made for up to 220 lb. of bombs.

Excellence of view is, of course, one

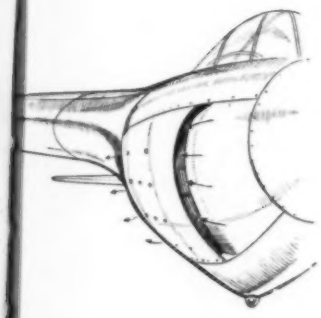
...MÉLANGE

...Paris Show



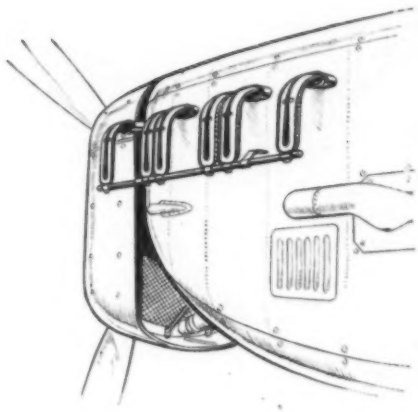


The upper left-hand sketch is of the bomb traps arrangements in the twin-engined Fokker G.1. That above explains the method of driving the two airscrews of the Koolhoven (Lorraine Petrel).



(Left) A cooling "gill" on the New Koolhoven fighter.

(Right) The peculair exhaust arrangements which seem to have been standardised for liquid-cooled Hispano are visible in this sketch of the nose of the Mureaux 190 C.1.



of the main advantages of the high-gull-wing machine, and this advantage has been fully utilised in the Loire 46. This machine is not outstandingly fast, being capable of 242 m.p.h. with a 1050 h.p. Hispano two-row radial. It may be distinguished from the P.Z.L. by its undercarriage legs, which are attached to the bracing struts of the wings and by its peculiar strut-braced tail.

Armament may be made up of two wing-mounted *canons* and two drum-fed machine guns, or of four machine guns. Firing and loading is effected pneumatically.

On the Romano stand is a model of an intriguing biplane fighter with gull-type top main planes and a retractable undercarriage.

Multi-Engined Multi-Seaters

Speeds in the region of 300 m.p.h. are claimed for at least three of the twin-engined military types appearing this year. Greater advances appear to have been made in the development of this class than in any other direction; the Bristol, Hanriot, Potez and Fokker types are some of the most-discussed machines in the Salon.

The Bristol Blenheim is actually the first production model and bears no markings to break the symmetry of its lines. It is so mounted that enquiring eyes can be directed through the bomb-aimer's window in the nose up into the pilot's compartment; but the cabin is sealed. Only from the balcony of the Salon is it possible accurately to gauge its true proportions: there is nothing of the freak about it, yet it strikes one because of its obvious practicability and built-in performance.

Bristols are also showing models of the 130 bomber-transport and of the 138 altitude-record-breaker.

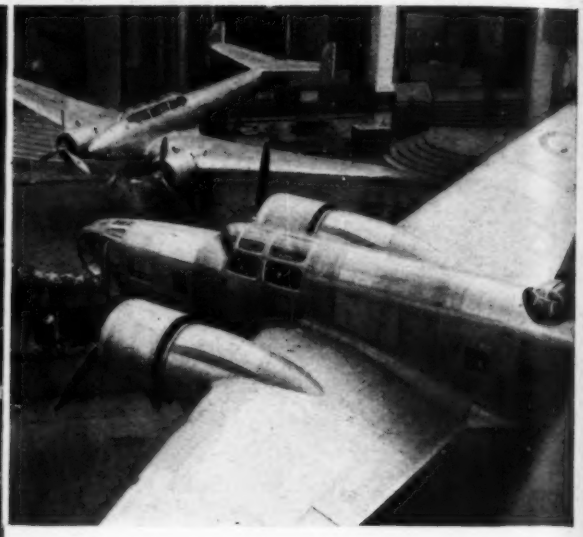
The two most unconventional machines in the light-medium twin-engined category are the Hanriot 220 and the Fokker G.1.

The Hanriot is classed as a light, multi-seater defence machine (*muitiplace leger de defense*) and is quite a new departure. A mid-wing, all-metal monoplane of small dimensions, it is a three-seater with a pair of Renault inverted vee-twelve air-cooled engines. Alternatively the new Gnome Rhone small-diameter 14Mars radials may be specified. With Renaults the speed is just under 290 m.p.h., but with the Gnome Rhones it is estimated to be capable of 310 m.p.h., and to be able to climb to 26,250 ft. in about 10 minutes.

The crew of three is seated in tandem cockpits with enclosures. In front is the pilot who has control of the two *canons* mounted in the bottom of the fuselage and of the two machine guns in the wings. Behind the pilot is a position for the *chef de bord* and finally there is the rear gunner's position. Elaborate wireless equipment is specified.

The wing flaps extend throughout the span, even the ailerons being split. A special method of wing construction enables fuel to be carried in tanks along the leading edge.

Fokker's G.1, *Le Faucheur*, is likewise of more than usual interest from structural and tactical viewpoints. Primarily the machine is planned for attack work, but is eminently suitable, in addition, for bombing and reconnaissance.



An advanced trainer built on modern lines, the Morane Saulnier M.S.430 on the left does 223 m.p.h. The Marcel Bloch 131 bomber, shown above, seems a very practical machine, considering that it achieves over 250 m.p.h. with more than 2,000 lb. of bombs. In the background, the Potez 63.

Structurally the wing and fuselage form one unit, but as the fuselage terminates just behind the trailing edge it is necessary to carry the tail on two outriggers which continue straight aft behind the engines. The extremities of these booms are connected by the tail plane which carries an elevator extending over its entire span. The actual machine on exhibition has a typical Fokker wing made up of two box spars with spruce flanges and plywood webs and ribs of plywood, the entire covering being bakelite plywood, but a metal wing can be supplied if desired. The fuselage is of mixed construction, but the outriggers have metal stressed skin.

In the nose of the fuselage are two fixed Danish Madsen machine-guns of 7.9 mm. calibre with 550 rounds apiece, and a little to the rear, one on each side of the pilot, are two 23 mm. Madsen *canons* with drums for 100 shells each. In the extreme rear of the fuselage, or nacelle, is a special Fokker conical turret which gives a perfect aerodynamic stern portion. The turret is of Plexiglass and contains a 7.9 mm. Madsen mounted on gimbals. It is arranged to turn a complete circle on an axis in the direction of flight, and the gun can be fired irrespective of its position.

About 880 lb. of bombs can be carried in the lower portion of the fuselage when the machine is used purely as a bomber. The two *canons* are included in the armament only for specialised attack work.

It is estimated that with two Bristol Mercury VII engines (the machine exhibited mounts Hispano 80-02s) the maximum speed will be 292 m.p.h. at 14,500 ft. and that the climb to 26,300 ft. will occupy only sixteen minutes. Terminal velocity dives are said to be permissible.

People who should know a good aeroplane when they see one are loud in their praise of the new Potez 63, like the Hanriot, a *triplace leger de defense*, but somewhat larger, and planned to perform as a fighter, bomber or reconnaissance machine.

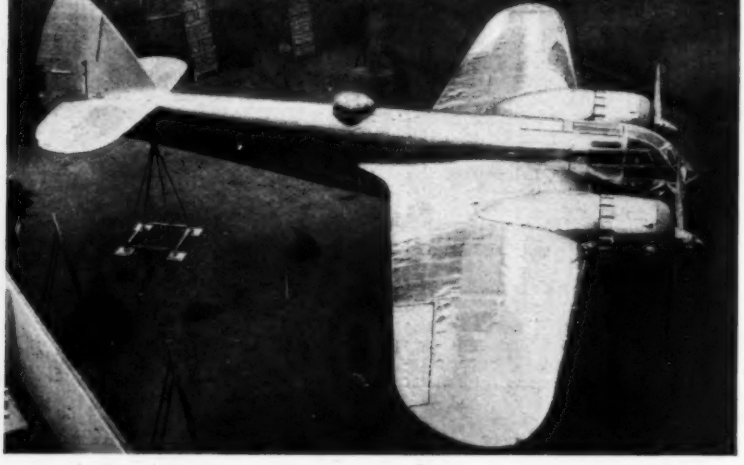
The machine is a low-wing cantilever metal monoplane mounting two Hispano-Suiza 14Hbs radials (680 at 11,480 ft.) and is credited with a maximum speed of over 300 m.p.h. and a five-minute climb to rated altitude. All aerobatic manœuvres are possible.

Retractable undercarriage, flaps, variable-pitch airscrews and a surprisingly slim fuselage are features. The tail plane has a very pronounced dihedral angle, not, as might reasonably be supposed, for aerodynamic reasons, but to keep the fins and rudders well clear of the ground.

Two *canons* mounted in the lower part of the fuselage, and a free rear machine-gun, wireless, night-flying equipment and gear for internal communication figure in the load, and provision is made for about 92 gallons of fuel.

A model is shown of a similar machine equipped with what presumably is an abdominal gun position.

Another French twin-engined model which seems to be planned on sound lines is the Marcel Bloch 131 bomber intended to be powered with two Gnome Rhone or Hispano-Suiza fourteen cylin-



Although the Bristol Blenheim medium bomber is far from being a freak it is attracting as much attention as anything in the Show.

Part of the Presidential escort before the Breguet Vultur (462 B4) heavy bomber.

der radials of about 1,000 h.p. each. A speed of over 250 m.p.h. is claimed, although the landing speed is said to be less than 60 m.p.h. Approximately a ton of bombs can be carried, and the ceiling is over 27,500 ft. A Hispano *canon* is mounted as a free gun in the nose, and there are upper and lower machine-gun posts aft of the wings.

The construction seems even better than one has come to expect from a Bloch.

Breguet has his latest development in the bomber line which he calls the Vultur. The wings of this machine are similar to those of the Fulgur transport monoplane, a mock-up of which, incidentally, was at the Salon two years ago.

In the first instance the machine is planned as a bomber, but is easily adaptable for long-range reconnaissance and fighting missions. Fitted with two Gnome Rhône 14No supercharged engines of 950 h.p. each, it is claimed to be capable of 254 m.p.h., which, considering that its fuselage design has not sacrificed practicability to sheer performance, is very creditable. With two 1,325 h.p. units, for which it was designed, it is estimated to do about 300 m.p.h.

The machine is soundproofed, has complete heating arrangements, automatic pilot and wireless, and is armed with a 20 mm. *canon* on a special free mounting in the bows and two rear machine guns.

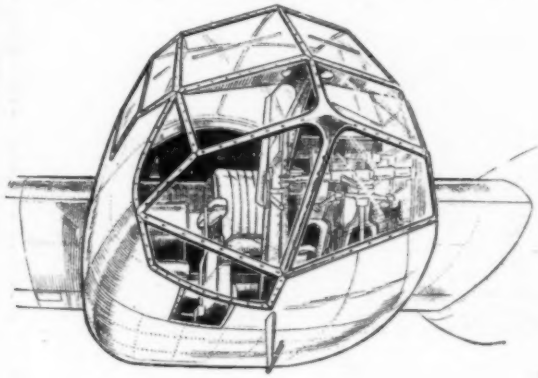
The undercarriage retracts rearward into the engine nacelles, flaps are fitted to assist landing and take-off, and the airscrews are of variable-pitch type, being Gnome Rhônes or Hispanos according to the engines fitted.

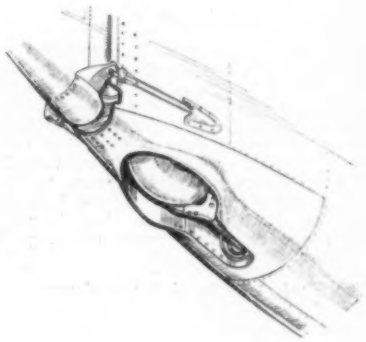
When it first appeared, the prototype of this machine had a single tail boom, but this has been replaced by a more normal type of rear fuselage which, although of small cross-section in comparison with the forward section, should be much stiffer in torsion than the boom.

In essentials this machine is similar to the Breguet 461 delivered to the Japanese Government this year.

Single-engined General Purpose

There is still a market for the two-three-seater machine capable of operat-





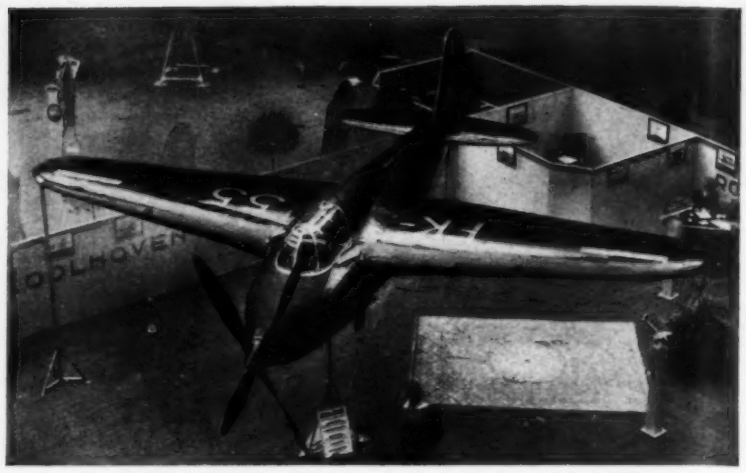
On the left is the nose of the Bristol Blenheim Medium bomber (Britain's sole aircraft representative), while the right-hand sketch shows the retractable tail wheel installation.

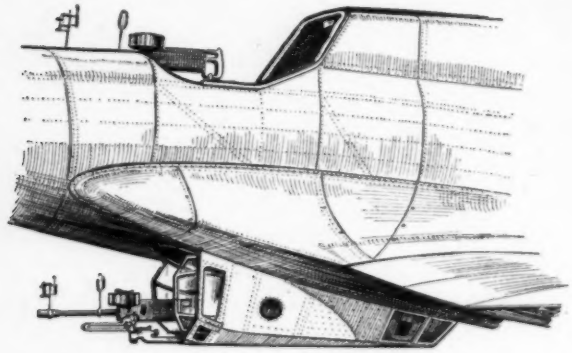
ing as a bomber, reconnaissance machine and, at a pinch, as a fighter.

A Czechoslovakian, a Polish and a French type designed for these duties are being shown. The Czech representative is the Letov S528, a sturdy biplane of conventional appearance. With a 950 h.p. Gnome Rhône 14No. engine it is claimed to do nearly 200 m.p.h. and to have a range and ceiling, respectively, of 559 miles and 31,500 ft.

The Polish effort is a monoplane made by the P.Z.L. concern and designated the 43. Although this type has a very fair performance (230 m.p.h. with a 950 h.p. Gnome Rhône 14N), utility, field of fire, roomy accommodation and the ability to operate from confined spaces have not been dispensed with in favour of ultra-high speed and rate of climb.

An armament of one or two front guns and two similar weapons at the rear (one above and one below the fuselage) can be carried in addition to a bomb load of





(Above) The sensational Koolhoven fighter with its twin airscrews and Lorraine Petrel engine mounted behind the pilot. On the left are the rear defensive arrangements on the P.Z.L. 43.

up to approximately 1,700 lb. in weight.

Centre section slots are fitted as on the little P.Z.L. two-seater tourer which was at the Show two years ago.

An alternative engine installation to the Gnome Rhône is the Pegasus VIII (660/680 h.p at 13,100 ft.), built in Poland by P.Z.L. The undercarriage is of a fixed type with telescopic "trousers."

The Mureaux machine, the 200 A.3, is intended primarily for observation work and is virtually a three-seater development from the well-known parasol-winged 113 two-seater standardised by the French Air Force. The Hispano Y engine of this model has a frontal radiator and the new type of exhausts, and gives a maximum speed in the vicinity of 200 m.p.h.

Training

Although only three military training types figure in the Show they are quite representative of the advanced instructional equipment now in demand.

The Romano 80 is a sturdy biplane with stagger and a large gap and is intended for advanced flying instruction and aerobatic training. As shown, the machine is fitted with a Salmson 9 ABA radial of 280 h.p. The fuselage is a welded structure with metal covering back as far as the rear cockpit and the wings are of wood. The fuel supply is arranged to permit inverted flying.

A more recent model, the Morane Saulnier MS 430, has a 390 h.p. Salmson radial and is a two-seater low-wing cantilever monoplane modelled on the lines of the MS 405 fighter previously mentioned. The Gnome Rhône K7 of about 400 h.p. is an alternative installation, and the maximum speed is no less than 223 m.p.h. at 6,560 ft.

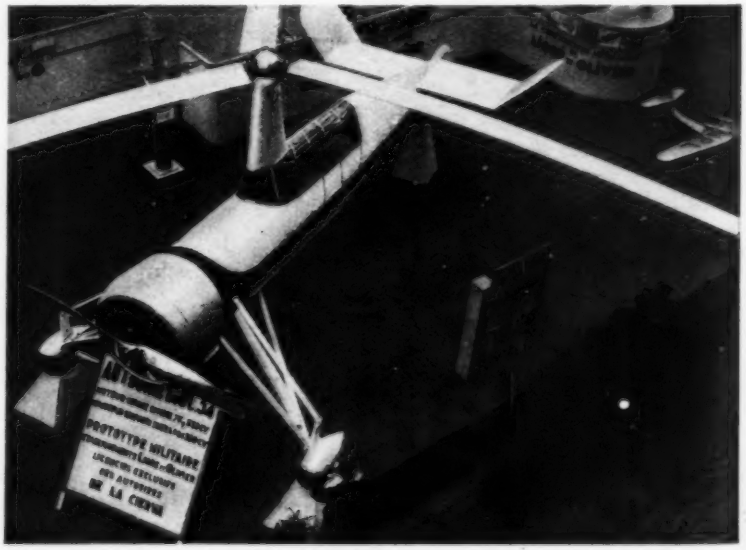
The method of mounting the machine on its stand gives rise to much idle banter, but the aircraft itself seems a very sound proposition for the training of embryo pilots of high-performance monoplanes.

An even faster training type is the single-seater Caudron Rafale, developed from the two-seater Rafale which has distinguished itself in sporting events. As a single-seater fighter-trainer this model is offered in two versions, one with a 220 h.p. six-cylinder Renault and the second with a four-cylinder engine of 150 h.p. These types are known respectively as the C.690 and C.720.

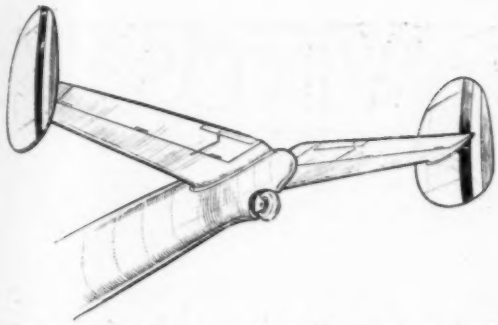
In general lay-out the machine is reminiscent of our Mew Gull and is equipped with a camera gun and O.P.L. luminous gun sight. With the more powerful engine the speed is given at 230 m.p.h.

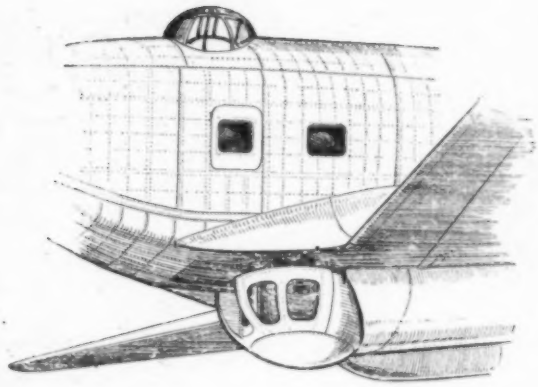
Miscellaneous

Loiré et Olivier are presenting for the first time the prototype of a military Autogiro available with a Gnome Rhône or Hispano Suiza engine of about 350

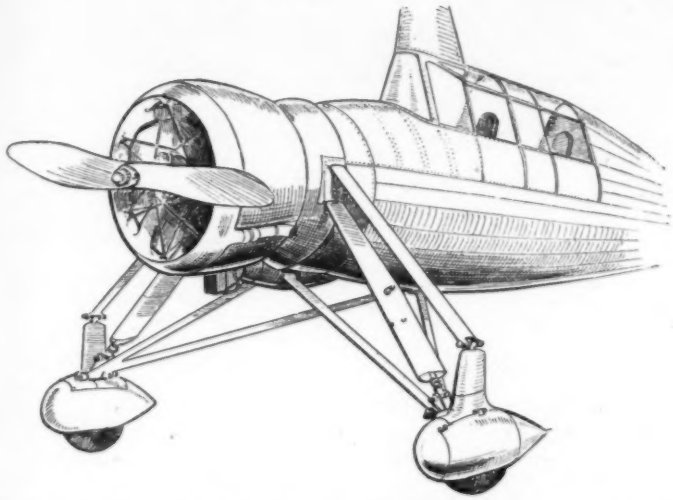


The Lioré et Olivier Autogiro shown this year has been designed for military work and should prove one of the fastest machines of its type yet built.





(Above) the tail of the new twin-engined Potez 63 three-seater fighter-bomber and (right) upper and lower gun positions on the Bloch 131.



A sturdy undercarriage is, of course, essential for any Autogiro, especially when used for army co-operation in rough country, which is one of the duties of this Lioré et Olivier.

h.p. This should prove the fastest Autogiro in the air. The fuselage is very clean and contains two tandem cockpits with transparent enclosures. From the forward enclosure springs the streamlined rotor pylon carrying a three-bladed assembly. The fin is unusually small and the undercarriage a substantial type of new design. Although classed as a military machine there are no signs of armament, so presumably it is intended purely for *liaison* work with ground forces.

The remaining military exhibits are not new, but are included by the French Air Ministry as representative Service types. One is the Potez 452 two-seater "catapultable" flying boat, and the other a Gourdou 832 twin-float low-wing monoplane, also for naval duties.

The French Navy is obliging with an exhibit of models of standard Service types, of which there seems to be rather too great a variety for economical ship-board operation. One class not to be found in our own Fleet Air Arm is a specialised single-seater dive bomber.

Re-equipment is proceeding apace with up-to-date monoplanes and biplanes.

India to Build Hawks

CAPTAIN EADON, Governor of the Aeronautical Training Centre of India, after a visit to England, has obtained a licence to manufacture the Mark II Miles Hawk Trainer for use in the Centre. Experiments are being made to use Indian timber in the manufacture of this machine. Additional staff has been engaged in England, and among these are two new engineer instructors who were formerly in the Air Ministry. Flt. Lt. Duncanson, now chief instructor of the Edinburgh Flying Club, and previously with Aircraft Exchange and Mart, has been appointed chief instructor.

Hawker-Siddeley Progress

THE balance-sheet of the Hawker-Siddeley Aircraft Co., Ltd., shows that profits for the year ended July 31 amounted to £502,919, almost wholly composed of dividends from the subsidiary companies. After charging £118,649 for income tax, deducting the 30 per cent. dividend and the 10 per cent. share bonus to the old shareholders, there remains a balance to go forward of £10,634.

The operating companies have received from the parent advances of £1,028,076, so that the resources of the group are being very fully employed.

The first ordinary general meeting is to be held at the May Fair Hotel, London, next Wednesday, November 25.

A Winifred Spooner Memorial

THOSE who knew Miss Winifred Spooner may be interested to learn that a memorial to her has been founded. It is in the form of a scholarship at Miss Spooner's old school, Sherborne School for Girls, and was founded a short time ago by a few of her personal friends. The object of the scholarship is the encouragement of character rather than book learning, and in the award special emphasis is laid on qualities such as courage, enterprise, independence, and generosity of mind, since it was such qualities above all that Miss Spooner possessed. That the sum awarded may help a girl to follow her bent, or help her to pay for her education in a chosen career, is also one of the objects of the scholarship.

The founders, and the governing body of Sherborne School for Girls think that there may be friends of Winifred Spooner's, in the aviation world and elsewhere, who would like to subscribe to the Foundation in her memory, and state that any donation would be very welcome. Subscriptions should be sent to The Bursar, Sherborne School for Girls, Sherborne, Dorset.

Generous Gifts to the R.Ae.S.

THE Council of the Royal Aeronautical Society announces that Mr. C. R. Fairey, M.B.E., F.R.Ae.S., past president, and Mr. F. Handley Page, C.B.E., F.R.Ae.S., vice-president, have jointly agreed to give £750 a year for seven years to the Society

The object of this generous gift is to enable the R.Ae.S. to carry out as fully as possible its main object, "the general advancement of aeronautical science and engineering" and to enable it to be placed on a self-supporting basis.

This announcement will be received with general satisfaction by all who appreciate the good work which the R.Ae.S. is doing, and will help materially in extending that work. To the younger generation particularly, the opportunity for the exchange of ideas and experience which the R.Ae.S. affords is valuable, and the whole aircraft industry should benefit as a result of the increase in certain and regular income which the new gift will ensure.

THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS

A "G.P." AT THE SALON. The Polish P.Z.L. 23 monoplane is a bombing and reconnoitring type, or what we should know as a general-purpose machine. Upper and lower rear gun positions are included and the maximum speed with one of the new Gnome Rhône 14N-01 engines (950 h.p. at 12,460 ft.) is claimed to be 230 m.p.h.

AIR Chief Marshal Sir H. Robert Brooke-Popham, G.C.V.O., K.C.B., C.M.G., D.S.O., A.F.C., Inspector General of the Royal Air Force, has been appointed Governor of Kenya.

To-morrow, November 20, at 8 p.m., Lord Londonderry is to lecture on "Airways of the Empire—their History and Development," at University College, Shakespeare Street, Nottingham. No tickets are required.

A house dinner to Messrs. C. W. A. Scott and Giles Guthrie is to be held at the Royal Aero Club next Thursday, November 26. Members may obtain tickets at 5s. each.

Aldergrove R.A.F. station is to be the subject of one of the most ambitious outside broadcasts yet attempted from the Northern Ireland Regional. ". . . Ad Astra," to be broadcast on November 26, will reflect the daily life and work of the officers and men.

It is hoped that it will be possible to broadcast communication between the ground and a fleet of machines in the air. The programme is being prepared in full co-operation with the Air Ministry. Two commentators will take part in the broadcast, and at least ten microphones will be used.

Next Monday, November 23, the second Brancker Memorial Lecture will be delivered by Mr. D. H. Handover, traffic manager of Imperial Airways, whose subject will be "Some Aspects of Empire Airway Organisation."

The lecture will be given at 6 p.m. at the Institution of Electrical Engineers, Victoria Embankment, London, W.C.2. Admission will be free, and no tickets are required.

The Aerodrome Owners' Association will hold its annual conference from January 20-22 next year. There will again be an exhibition of aerodrome equipment, supplies and services.

Up to the moment about forty companies have expressed a desire to participate in this exhibition. Any other firm interested can obtain full particulars from the Aerodrome Owners' Association, 32, Saville Row, London, W.1.

The low-wing monoplane trainer (Gipsy Twelve) being built for the Air Ministry by De Havillands has side-by-side seating, front and rear guns and dual control. Dimensions are: Span 47ft. 5in., length 35ft. 8in., and wing area 257 sq. ft. At an all-up weight of 6,000 lb. the wing loading is 22.5 lb./sq. ft., and the power loading 13.6 lb./h.p.

A DISTINGUISHED GROUP on the Bristol stand at the Paris Show. In uniform, near the left, is the British Air Attaché in Paris, Group Capt. D. Colyer, D.F.C.; next to him is M. Lebrun, President of the French Republic; then comes Capt. Bartlett, the Bristol representative in France; and, near the right, with umbrella, Sir George Clerk British Ambassador.

YATESBURY sets the PACE

A Visit to the Civil Training School Operated by the Bristol Aeroplane Company

(Illustrated with "Flight" photographs)

Something to "home" on—the famous Wiltshire white horse on the downs near Yatesbury, as seen from the air.

IN the first throes of expansion there may have existed a tendency to turn out pilots as so many ciphers, so many young men whose uniform distinction was that in two months of potted flying they had broken the ice of a Service career. There was a possibility that the pilots thus mass-produced would not have time to realise that they had become a part of a Service tradition.

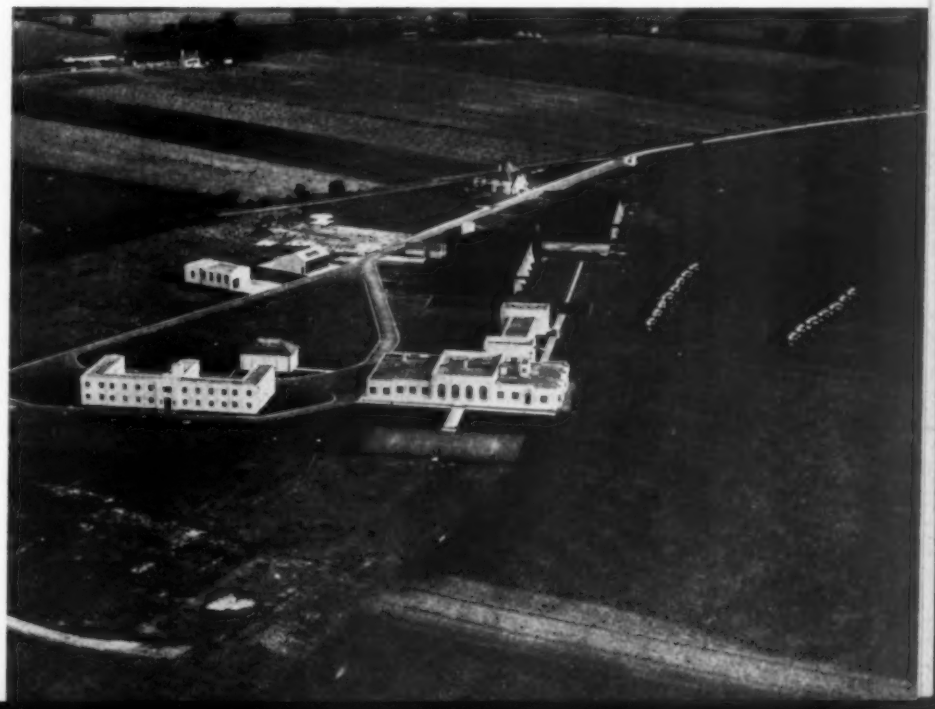
Now, it is a very great responsibility which rests upon the authorities in charge of the new training schools. There was no demand that instructors should instil a reverence for the very young traditions of a very young Service, not yet in its majority. There is all the more credit due to those who, of their own volition, have taken up the new training schools and are giving the *ab initio* pupils a sense of responsibility, of leadership, of the qualities proper to an officer as well as a pilot.

Let us now praise the Bristol Aeroplane Company for their part in raising the fledglings. Faced with a choice of skimping through the letter of their contract or taking a bold stand and making a thoroughly good show of their new school and wing, they have unhesitatingly made at Yatesbury a model school whose pattern few will equal and none will excel. Those pupils who are first posted to Yatesbury can thank their lucky stars and be prepared in advance that wherever they go after their short course is ended they will tread on harder ground and sleep in much stiffer beds!

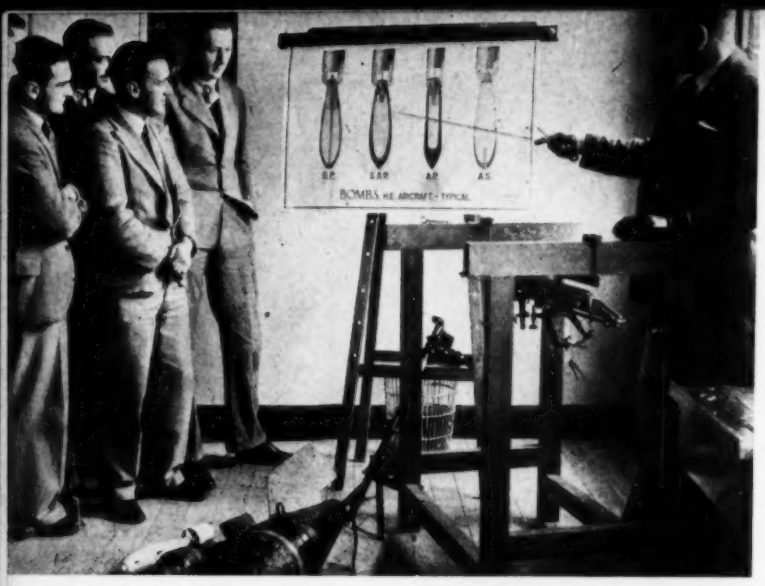
THIS is the third of a series of articles describing visits to what are usually somewhat misleadingly termed "Civilian Training Schools"—in other words, schools, operated by various firms, which provide a course of flying and other training in preparation for a career either in the Royal Air Force or in the R.A.F. Reserve. Previous articles in the Series appeared as follows:—
Sywell, Northampton (Brooklands Aviation Ltd.), August 13.
Woodley, Reading (Phillips and Powis Ltd.), October 8.

It is an odd fact that Yatesbury seems only vaguely known. People agree it is somewhere in Wiltshire, and not very far from Bristol, but they are uncertain where this gem in a green land lies. It is situated some fourteen miles from Swindon and midway between Marlborough and Chippenham. The aerodrome caps a fold in an escarpment which overlooks the west lands towards Bristol. It is windswept and high, it is a countryman's paradise, it is a land where the hares know no boundaries and horses are ridden over gallops with a free rein. It has the best outlook of any mess in the country (except possibly Donibristle), and it is right off the map and out in the green and blue.

This pastoral panorama is the view from the ante-room, and on these ancient hills, where Druids trod forgotten centuries ago, a phœnix aerodrome has arisen. In odd places, and noticeably from the air, the overgrown and weeded foundations of the war-time aerodrome are visible. In a far corner the relics of a dilapidated hangar stand, forlorn and ashamed of the new-born glory that has replaced the old ramshackle huts; for the present offices and quarters stand boldly on the fringe of the low hills, visible from a long way off as clean and cream structures which mean business. Yes, Yatesbury looks like an aerodrome that is efficient. It has that indefinable orderliness and smartness which stamps it even from afar as a place which arouses an *esprit de corps* among all concerned with it.



Yatesbury's buildings and the fleet of Tiger Moths.



(Above) Yatesbury's curriculum includes subjects to be taken up—and dropped.

Here is a mess, one thinks involuntarily, which should stand as an example to others. Here is a place, one finds with surprise, which has spaciousness, generous lines, and the stamp of something superior. Mr. Campbell, the chief instructor, betrayed the secret of Yatesbury without realising how much he implied. To a pertinent question he answered (with the sincerity of a true Scot): "We are looking ahead. We built Filton, and found it wasn't half enough. This time we—that is, my directors—have decided to do a good job properly."

There is no doubt the Bristol Aeroplane Company has succeeded.

The Layout

The buildings are laid out in four main parts: Hangars, class rooms, mess and offices, and quarters. The basis of the layout conforms to that at Filton, but experience and more room has enabled several distinctive features to be incorporated. The mess and offices, being located in one unit, make the management virtually a matter of routine. The chief instructor, the time-keeper, and the pilots' changing rooms, are all at the landing ground end. The billiards room, ante-room and dining room are placed on the west side, where the benefits of the panorama are best appreciated. The ante-room is a room to be proud of. It is a happy compromise between old and new, for Crittall's steel windows frame the window openings in the Adam style: spacious, wide and clean-cut. They look out upon a terrace and crazy pavement which runs to the tennis court placed at a discreet distance away. Beyond is the Rugger ground, which probably looks less inviting in a bleaker wind.

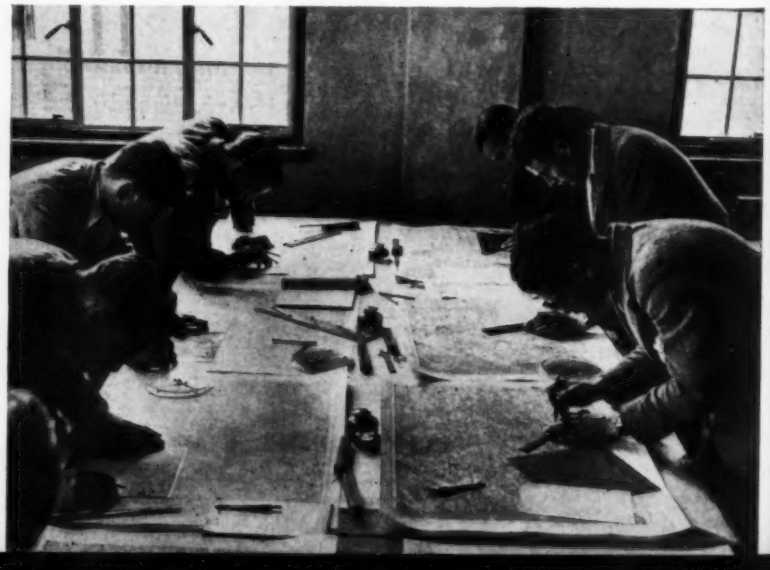
The ante-room is fitted with first-rate lighting, for which the Bristol firm of Christie Bros. must be given full marks. It is an exceptionally large ante-room, and necessarily so, for there is little temptation for the pupils to stray from the fold when the evening lengthens. This room has a fine, cheery atmosphere about it, with a huge fireplace and an additional warmth from a number of panel radiators. Nor are the appointments on less luxurious lines, and without being in any sense "pretty" the furniture—most of which comes from the renowned firm of Heal's—is just what an officers' mess requires.

Proceeding northwards there is a room reserved for Mr. Smith, the mess steward. As an ex-Artilleryman, Mr. Smith may be happily described as an old soldier in more than one sense, and the idea of having someone in his position relieves Mr. Campbell of a host of trivial details and enables the mess to be run with a creditable smoothness. Not that I am suggesting this is a sinecure, for Yatesbury has to cater for seventy heads, twenty-eight of which are on the course and live in. The system is for Mr. Smith to be responsible to the chief instructor for not only the officers' mess arrangements, but for the lunches, teas, etc., of the airmen and the station staff and stewards, the majority of whom avail themselves of the mess for intermediate meals.

The dining room lends itself to a natural T-shaped accommodation, and instructors and officer pupils take their meals here. Instead of the rather flat and unprofitable once-a-week-all-dine-in-together system of inculcating the ritual of Guest Night, Yatesbury conserves its energies for a once-monthly outburst. Real guests arrive, and are reluctant to leave. A real Guest Night is officially followed, and a good

The umbrella rack, otherwise the parachute store.

(Below) C.D.C.'s and concentration—pupils at work on course-plotting.



time is had by all. This system is the result of Yatesbury being rather out in the blue, for the scattered company of the eleven instructors who live out is more favourable to a limited periodic chance of getting to know their charges than would be the case if they had to meet them once a week.

The airmen have a separate mess adjoining, and these messes are served by a kitchen of which the Savoy chef might well be proud. This cook's delight is served by three Aga cookers, anthracite burning, and it says much for the staff that a surprise visit found it on tip-toes in an impeccably clean room. On the same plan is the airmen's mess, while the ground engineers and staff have a canteen mess abutting the kitchen. But the triumph of this building is the cloakroom and lavatories, where the designers have really let themselves go in an orgy of luxury appointments.

To the north of this building lies the block holding the quarters. This is E-shaped, the centre of the E being given over to the batmen and servants, whilst the pupils live on the first and ground floors of the remainder. Here one must say that the architect, Mr. Jones of the En-Tout-Cas Company, has the palm for a well-designed school. The whole of these buildings were built and planned by En-Tout-Cas, who, incidentally, were also responsible for the resurfacing of the aerodrome.

Two rooms on the ground floor have been amalgamated to make a silence room where pupils can write letters. But this reserve, if appreciated, is just another example of the spaciousness, for each pupil has a handsomely appointed room for his exclusive use. The furniture, by Maples, looks like a picture from an ideal home exhibition, whilst the extravagance of a soft bed and dainty curtains enhances the home-from-home effect. "Mind you," remarked Mr. Campbell, prepared to roll his R's verry seriously, "we don't spoil them. There's no lying back in bed and ringing a bell for a servant and tea . . . . ."

(Above) "Spotless" is the usual cliché applied to kitchens, but it can be applied without apology to that of Yatesbury.

(Above) A group of the pupils.

(Below) Compass-swinging indoors—instruction on a rotatable dummy aircraft.

For these quarters the pupils are charged a flat messing rate of 50s. a week. How this is done so cheaply is a mystery, especially as the Bristol Aeroplane Company built this section at its own expense, and without any financial aid from the Government. There are thirty bedrooms to this block, and eight bathrooms. Each room has running hot and cold water, built-in wardrobes, and a sufficiency of furniture. The airmen are not accommodated here, but sleep out at the Manor House in the village of Yatesbury, where they take charge of themselves.

Behind the quarters stand a number of outbuildings. There is a very smart power-house, where two Crossley engines are housed and supply the lighting requirements of the station. Some power is used for electric drills, but, with Filton so near at hand, most of the work is done at the parent aerodrome.

Bordering the road, two modern houses have been erected to accommodate the resident engineer and the foreman. In another building a refuelling van and two electric petrol pumps are installed. Next to this stands an accumulator house, where 230 accumulators are charged. And so across to the hangars, still retaining a nucleus of the war-time contour, but reconditioned and as sturdy as ever. In the nearest of these hangars stands the pride of Yatesbury, the fire engine.

This engine is the latest thing in Merryweather's fire-fighting units. It consists of a powerful engine, a number of fire extinguishers, and an apparatus which makes "foam." This delivers, by running off the engine, 250 gallons of fire-extinguishing foam, whose primary purpose is to enable the rescue party to save a pilot trapped in his cockpit. When the foam is exhausted, or independently if necessary, the engine can be used to pump water from a supply source. Fire-fighting equipment in the shape of knives, saws, asbestos suits, etc., is included in a tool box.

The Yatesbury instructional staff. Standing, left to right, are F/O. S. J. H. Carr, D.F.C.; F/O. E. G. Sharp; F/O. F. H. Buggé; Mr. W. Miller; Flt. Lt. P. J. Clayson, M.C., D.F.C. (chief ground instructor); F/O. L. H. Mason and F/O. W. J. Pearson. Seated are F/O. W. L. B. Palmer; Mr. Campbell (chief instructor); F/O. W. G. Stevenson; Flt. Lt. H. W. Raeburn and F/O. W. N. L. Cope.

Incidentally, such a unit as this should be an essential to any outlying station such as Yatesbury. The puny village fire brigade, the delays in answering calls, and the knowledge that reliance must be placed on outside help, are serious drawbacks to some stations which ought to be better equipped.

By the side of the fire engine stands an equally imposing ambulance, a Morris Commercial type with a sensibly large body. There are two berths, and, contrary to the usual style of ambulance, this vehicle has ample room for a doctor and nurse to be accommodated, with space to spare.

Between the mess and the hangars, where seventeen D.H. Tiger Moths are painted waspishly in black and yellow, stands the school. This has the normal subdivisions of rooms, but there were two features which seem worthy of recording. The first is apparently trivial, a mere door of louvre panels to the photographic dark room. This enables ventilation to be given to those in inner darkness, and in the warm weather it is certainly a useful asset to an enclosed room. The second is an indoor compass table. This consists of a pedestal on the summit of which is pivoted a dummy aeroplane. At the pivot centre a Service compass is affixed, and Flt. Lt. P. J. Clayson, M.C., D.F.C., the chief ground instructor, explained that this instrument proved invaluable in showing pupils how to swing a compass. One remembers the melancholy procedure that used to be adopted: of a dozen bored pupils man-handling an aircraft on a compass base whilst an instructor sat in the cockpit and showed two pupils perched by his side how to do the job. This indoor method is obviously very satisfactory, and for such simple things as showing how a bearing plate is off-set proves equally valuable, as a single demonstration shows more than does a lengthy lecture.

The system of running the classes is slightly different from that commonly followed, but it is highly efficacious, for Mr. Campbell has experienced no trouble in completing the scheduled time. The pupils are divided into two classes, A and B. A takes the whole of Monday morning flying, and the whole of the afternoon at lectures. B does lectures in the morning and flying after lunch. On Tuesday B flies first, and A takes lectures and so on. The result is that the precious minutes wasted in changing over classes are saved at Yatesbury, and the programme can be completed without anyone straining his neck to do it. On good flying days the whole school flies, leaving the lectures over.

That completes the school, on paper. One satisfactory innovation is that after the pupils have passed on to the Service the results of their passing-out are now communicated to the instructors who handled the raw material. Yatesbury has just received an account of its first-course pupils, and it is gratifying to see that most of the ex-pupils passed out with high percentages at their stations.

The Rugger Team

But nowhere more strongly is the spirit of Yatesbury shown than in the Rugger team which Flying Officer S. J. H. Carr, D.F.C., runs. This present team has good material drawn from the twenty who play Rugger, and having beaten Netheravon they are definitely tails up. Mr. Davis is acclaimed as a promising stand-off, and Mr. Marvyn is predicted a bright future at centre: he was formerly with the Palestine Police, so it is not surprising he has inside knowledge.

Yatesbury is very keen on Rugger. A local competition has been instituted with Filton, the trophy being the up-ended extremity of a Bristol engine piston mounted on a wooden pedestal. Each course plays one match for this trophy, known as the Blenheim Cup, and the friendly encouragement of rivalry between parent and offspring aerodrome is very encouraging to the young idea.

The remaining instructors now at Yatesbury are Flt. Lt. H. W. Raeburn, F/Os. W. N. L. Cope, W. G. Stevenson, F. H. Buggé, E. G. Sharp, W. J. Pearson, L. H. Mason, P/O. W. L. B. Palmer, and Mr. W. Miller.

One takes away pleasant memories of Yatesbury. Is it to be wondered that senior officers regard this as an exemplary school? It is remarkable that this Gleneagles in Wiltshire is setting a standard none may be ashamed to envy. In the words of that inimitable imitator of majors, Mr. Nelson Keys, one may say sincerely: "Jolly good show, you fellows."

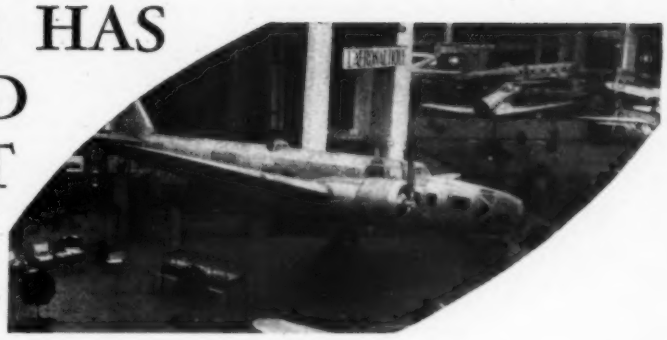
B. J. H.

IN THE ADEN COMMAND

THE proper designation of the Aden Command is "British Forces in Aden," as the A.O.C. has at his disposal certain Army units as well as No. 8 (Bomber) Squadron and an armoured car section of the R.A.F. The military units consist of the Aden Protectorate Levies (namely, one dismounted company and one machine gun troop) and one heavy battery, R.A., one anti-aircraft section, R.A., and one fortress company, R.E., of the regular Army. In normal times the day-to-day work of watching over the welfare and misdeeds of the hinterland is carried out mainly by the Vincents of No. 8 (B) Squadron, but during the Italian invasion of Abyssinia the Aden garrison was reinforced by No. 12 (Bomber) Squadron and No. 41 (Fighter) Squadron.

Consequently, when a section of the Aulaqi tribe showed a recalcitrant spirit towards the orders of the Government about the end of last June, they were visited by no fewer than twenty-three aircraft drawn from the three squadrons. This was merely a display of force, and, strange to relate, it did not immediately produce the customary effect. Matters had to proceed to an air blockade of the recalcitrant villages—following, of course, on the customary forty-eight hours' warning. Seven days of this blockade proved too much for the spirit of the tribesmen, and they then submitted and paid their fines in full. The political officers consider that this air action had a most salutary effect over a widespread area in the remote sections of the Protectorate to the N.E. of Aden.

HOW FRANCE HAS NATIONALISED her AIRCRAFT INDUSTRY



Plans and Administrative Methods Fully Explained

THE "nationalisation" of the various French aeroplane manufacturing companies, as authorised by French Parliament last summer, has begun to take definite form. In accordance with the principles elaborated at Geneva, the government desires directly to control all the industries devoted to the manufacture of war materials, including that of aeroplane construction. It is also desired to centralise the aviation factories and to concentrate the various companies in groups throughout the provinces, thus decentralising the comparatively large number of aviation concerns at present situated in and around the Paris district. By so doing the government likewise expects to control the alleged exorbitant profits made by manufacturers of various kinds of armament.

With this end in view five *Sociétés Nationales de Construction Aeronautique* are being formed, and will be located in various parts of France.

The organisation of the first has already begun. It is termed the *Société Nationale de Construction Aeronautique de l'Ouest*, and will be composed of the Breguet and Morane-Saulnier concerns, now located in the Paris district, together with the Loire-Nieuport factories, one of which is situated at Issy-les-Moulineaux (a Paris suburb) and the other (the principal one) at Saint Nazaire. The Breguet seaplane shops at Le Havre and the Morane factory at Puteaux (Paris) will, it is reported, not be acquired. The Breguet shops at Villacoublay will be taken over by the government *Service Technique*.

M. Henri de l'Escaille, at present managing director of the Loire-Nieuport Company, will be the president of the new *Société Nationale*, and M. Marius Olive, director of the Breguet-Morane Saulnier Company, will be the administrative director. M. Marcel Nordman, a former magistrate, will also be a director, representing the government.

Preliminary Steps

As a preliminary step in the organisation of this *Société Nationale*, a small company of 100,000 francs capital, consisting of 200 shares of 500 francs par value each, has been formed, and will take over such assets of the constituent companies as are desired, also accepting orders as received pending the organisation period. The assets will be acquired by direct negotiation or after appraisal by experts.

Two-thirds of the capital stock of this small provisional company has been subscribed by the government, while the remainder has been taken by some twelve subscribers. MM. de l'Escaille, Marius Olive and Marcel Nordman have acquired fifteen shares each. The Loire-Nieuport Company and three subscribers of that concern have ten shares, while Louis Breguet and four of the directors of his company have subscribed for eleven shares. It is reported that appraisal proceedings will be immediately begun.

The statutes of two other *Sociétés Nationales* have also just been filed:—

(1) Those of the *Société Nationale de Construction Aeronautique du Nord*, which will comprise the Potez shops at Meaulte, the Amiot plant at Caudebec-en-Caux and the Mureaux factory at les Mureaux. M. Henry Potez will be the administrative director.

(2) Those of the *Société Nationale du Sud Ouest*, which in turn will comprise the Courbevoie and Chateauroux plants of Marcel Bloch, the factory of the Union Co-operative Aeronautique (Blériot-Farman-les Mureaux) at Bégles, the Potez-Bloch shops at Bordeaux and the Lioré-Olivier plant at Rochefort. The *Bureau d'Etude* (design and drafting office) of Marcel Bloch will also be included, according to latest reports. M. Marcel Bloch will be the administrator.

As in the case of the organisation of the first *Société Nationale*, mentioned above, small managing companies of 100,000 francs capital each will be formed to acquire the assets and receive orders for the *Société Nationale du Sud Ouest* and that of the North during their organisation period. M. Henri de l'Escaille will be the president of both, and M. Marcel Nordman will act as government administrator. The government will subscribe for 66⅔ per cent. of the capital stock—134 shares—in each company. In the case of the *Société du Sud Ouest* M. Marcel Bloch will take twenty-five shares, Mm. de l'Escaille and Nordman fifteen shares each, while the remaining eleven shares will be distributed among five subscribers.

The list of the individual stockholders of the *Société Nationale du Nord* has not been announced as yet.

Other Organisations

The two remaining *Sociétés Nationales* will be likewise organised shortly. They will comprise:—

(1) *La Société Nationale du Centre*, composed of the Hanriot plant at Bourges and the Farman shops at Billancourt, which will be transferred to Clermont-Ferrand. The *Bureaux d'Etude* of both Hanriot and Farman will, it is said, be also included. M. Outhenin-Chalandre, a capitalist interested in aviation matters, will be *administrateur*.

(2) *La Société Nationale du Sud Est*, composed of the Lioré et Olivier shops at Argenteuil, the Potez factories at Berre and Vitrolles, and the design offices of Lioré et Olivier and Romano. M. Georges Arene, one of the directors of Lioré et Olivier, will be the *administrateur délégué*.

The Amiot shops at Colombes or the Romano factory at Cannes will not, it is said, be acquired.

Mm. Felix Amiot and Emile Dewoitine will conduct separate *bureaux d'etude* and have their designs constructed in government factories. The Potez plant at Sartrouville has been taken over for an arsenal and a new forty-passenger transport machine is being constructed there from the plans of Michel Wibault. It is said that the Blériot plant at Suresnes will be used for the construction of light machines for *l'aviation populaire*.

It is not intended, the writer is informed, to construct any particular classes of machines in any one of these new national companies. The orders will be distributed throughout them according to the various districts.

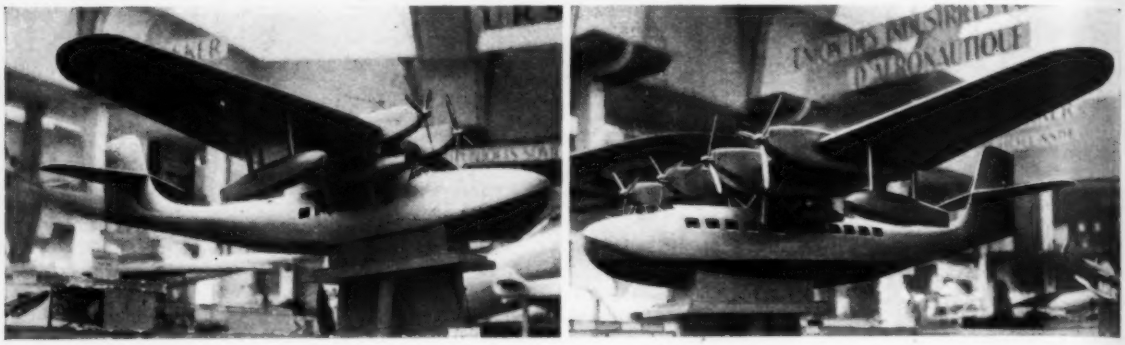
The committee which has had charge of co-ordinating these different plants is headed by M. Pierre Cot.

R. C. WOOD.

CIVIL TYPES in PARIS

Only One Large Commercial Machine : Advanced Russian Design : "L'Aviation Populaire" Well Represented

(Illustrated with "Flight" Photographs and Drawings)



Marine Aircraft : Two large scale models of Liore et Olivier flying boats. On the left is the H.47 *l'Atlantique* and on the right the H.246. Note the two different engine arrangements.

DOMINATING the surrounding types of smaller fry by its very size, the Farman F.224 claims attention as the only representative of the really large commercial aeroplane in the Show. The parentage of the machine can be traced back to the Farman F.222 four-engined bomber, which has been ordered in large numbers by the French Air Ministry, and to the *Centaur* used on the South Atlantic air route, where it holds the record for speed.

In general design the F.224 is a high-wing strut-braced monoplane of all-metal construction, the fuselage having been increased in depth as compared with the F.222 so as to give full head room in the cabins and still leave space under them for a large luggage compartment. The pilots' compartment is above one of the passengers' cabins and slightly ahead of the wing, and is about six feet wide. The view is fairly good in spite of the fact that the fuselage projects a considerable distance forward of the windscreen, and the space is such that the crew of first and second pilot, wireless operator and engineer can do their work in comfort and with space to move freely.

Forty Seats

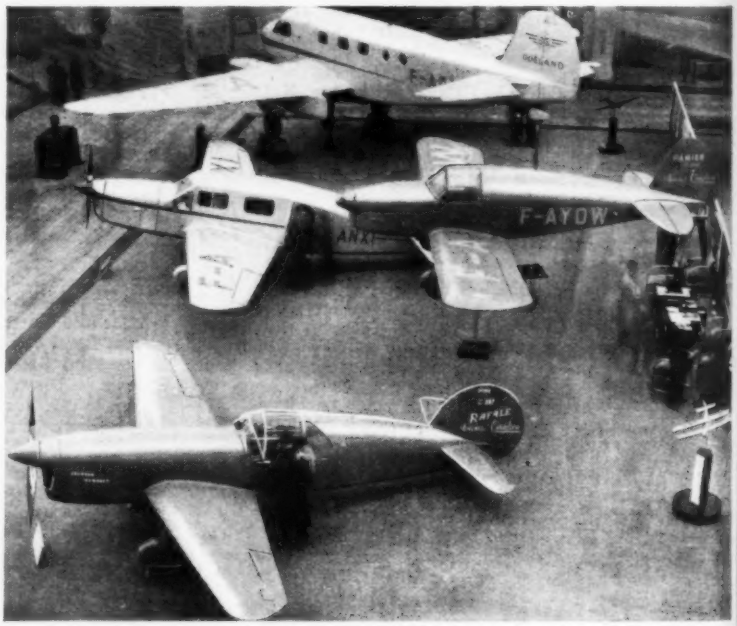
Accommodation is provided for 40 passengers, nine being accommodated in the forward cabin and three in the bar under the crew's room. Two steps lead up to the middle cabin, which has seating accommodation for eight passengers and is next to a smaller cabin seating four. Then follows a corridor with lavatory and similar accommodation, aft of which are the two last cabins, each seating eight passengers.

The four engines, which may be of any radial type of approximately 800 h.p. each, are arranged in two tandem pairs and drive variable-pitch three-bladed airscrews. The engines actually fitted are Gnome-Rhônes, type 14N, of a nominal 1,000 h.p. each.

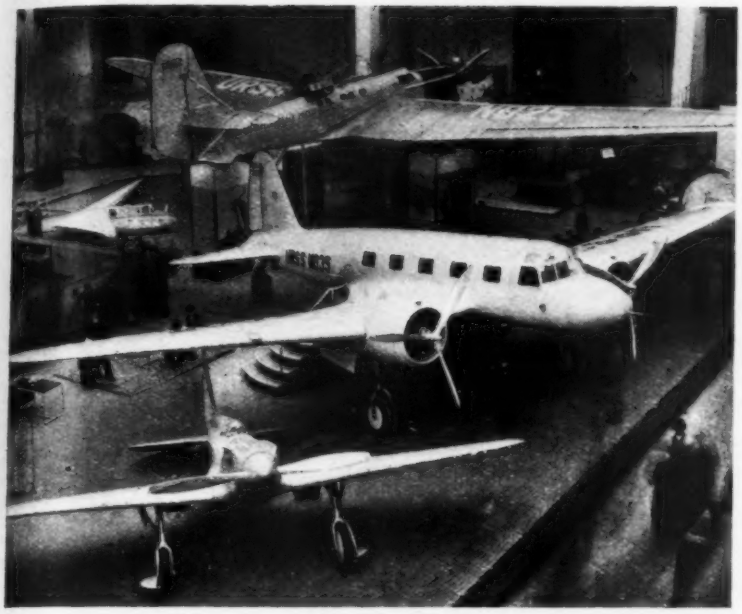
With a wing span of 36 m. (118ft.), the Farman F224 has a gross weight of 16,270 kg. (35,800lb.). With a total of 3,200 b.h.p. it has a maximum speed of about 190 m.p.h. The prototype is about to begin its tests, and when the machine has been tried out it will be put on Air France's London-Paris-Marseilles trunk route.

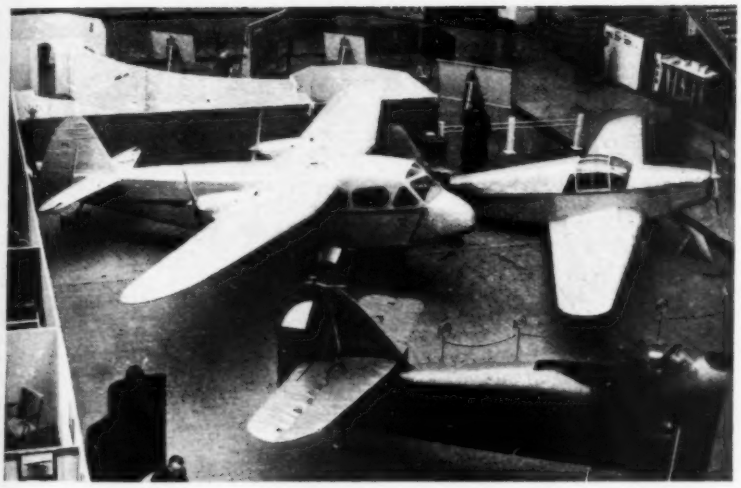
Although the Farman F224 is the only large commercial aeroplane actually exhibited, an indication of what is to come is afforded by a number of large scale models and drawings on one or two of the stands. For instance, Louis Breguet exhibits a cut-away sectional drawing of the Breguet 760 aeroplane, which is planned as a four-engined mid-wing monoplane with accommodation for 56 passengers on two decks. Liore and Olivier show two models of very large flying boats, the two designs evidently representing alternative engine placings, and the layouts differing in other respects also.

The LeO H.246 is a large commercial flying boat monoplane, with four Hispano 12 Xirs water-cooled engines abreast on the leading edge of the wing. Radiators in large venturi cowlings are placed under the tail ends of the engine



Numerous Progeny : Four of the seven Caudron types shown. In the foreground is the *Rafale* fighter trainer. Beyond are (on the left) the *Simoun* four-seater and (on the right) the *Ramier*. The *Goeland* bought by Mrs. Amy Mollison is in the background.





The pictures on the left show the Russian and Czech stands. In the upper photograph the Russian single-seater fighter is seen in the foreground. Behind it is the A.N.T.35 commercial machine and mounted high on the stand is the long-range A.N.T.25, beyond which can be seen the Russian glider. On the Czech stand the tail of the Letov general-purpose machine is in the foreground. Beyond it is the twin-pusher Praga E.210, and finally the Benes Bibi-Be 550.

An extremely pretty machine is the Amiot high-speed mailplane shown on the stand next to the Bristol. Curiously enough, the two machines are a good deal alike in their general conception, although the Blenheim is, of course, a bomber while the Amiot 341 is intended for carrying mails. Doubtless this fact explains the smaller fuselage of the French machine, mails forming a very convenient pay load which requires very little space per unit of weight.

Finish

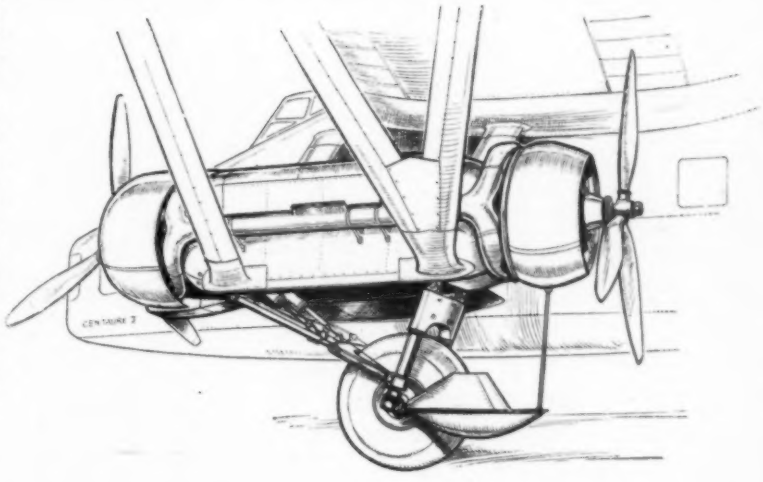
Of all-metal construction, the Amiot 341 is exhibited in a very highly-polished show finish, and coloured lights shining on it and reflecting their colours in the polished surfaces rather tend to make the machine look like a Pears Soap advertisement. However, there is no denying that the machine is very pretty, with its perfectly streamline fuselage and clean general design.

Designed to take any type of radial engine of more than 1,000 h.p., the Amiot 341 is exhibited with a Gnome-Rhône 14 Cars on one side and a Hispano 79.04 on the other, the Gnome-Rhône engine driving a Gnome-Rhône v.p. airscrew and the Hispano a Hispano-Hamilton airscrew. It goes without saying that the undercarriages retract into the engine nacelles. An automatic pilot is fitted.

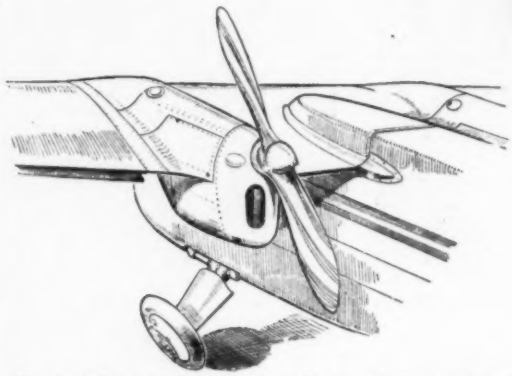
The main data relating to the Amiot 341 are: Wing span 75ft. 6in.; wing area 723 sq. ft.; speed at 13,000ft. 295 m.p.h. The tare weight of the machine is 8,800 lb.; the weight of fuel with full tanks is 4,400 lb.; crew and equipment (radio, etc.) account for 1,100 lb., and there remains available for pay load

nacelles in a position where one would rather expect them to be sprayed with water during the take-off. A placard states that the machine is to carry 26 passengers and 900lb. of freight over a range of 750 miles. The maximum speed is given as 208 m.p.h

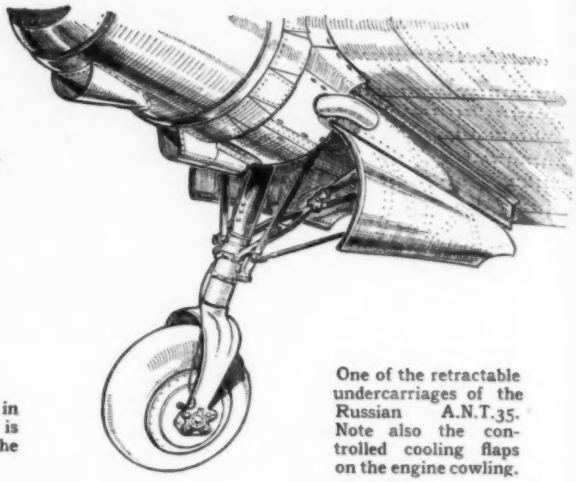
An interesting comparison with the Short Empire boats is provided by the LeO H.47 *l'Atlantique*, destined for service over the Southern Atlantic, which is shown as a scale model stated to represent a flying boat of 18 metric tonnes gross weight (approximately 40,000lb.). In this design the four Hispano 12Ydrs engines of 880 h.p. each are placed in two tandem pairs, and the maximum speed claimed is 223½ m.p.h. It is somewhat difficult to believe that this design is more efficient than that of the Short, and one is inclined to regard the speed figure as rather optimistic. The range is 2,500 miles and the pay-load 2,900lb.



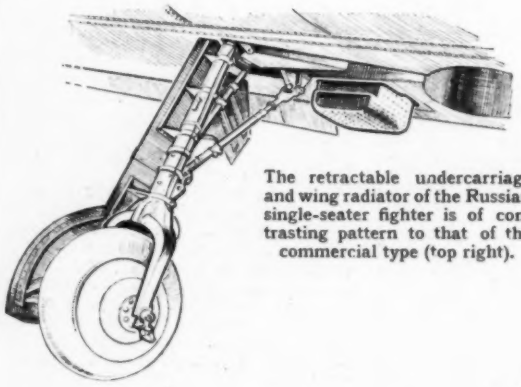
The tandem engine arrangement and retractable undercarriage of the Farman F.224.



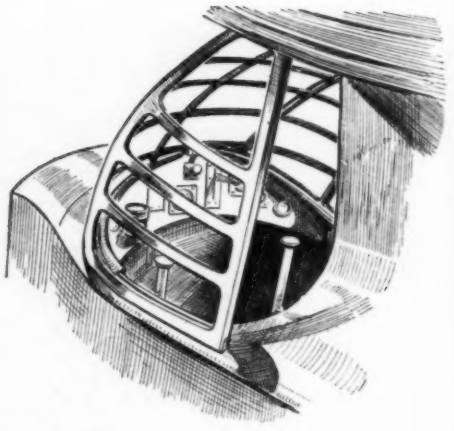
The installation of one of the Walter Minor engines in the trailing edge of the Praga E.210. The undercarriage is of cantilever type, with the springing housed inside the fuselage.



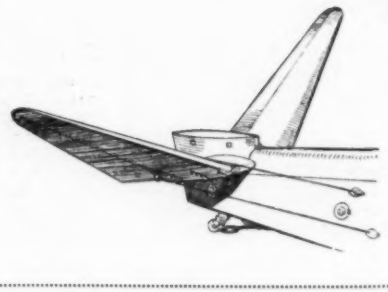
One of the retractable undercarriages of the Russian A.N.T.35. Note also the controlled cooling flaps on the engine cowling.



The retractable undercarriage and wing radiator of the Russian single-seater fighter is of contrasting pattern to that of the commercial type (top right).



Conduite Interieure on the S.F.A.N.5. The shape of the fuselage and wing-supporting stub provides a gap for ventilation.



The up-tilted tailplane of the Mauboussin Corsaire is intended to do away with the need for a rudder.

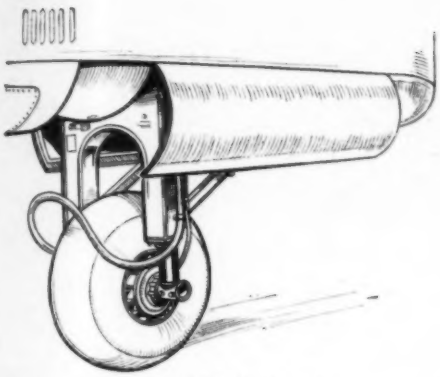
3,300 lb., giving a gross weight of 17,600 lb.

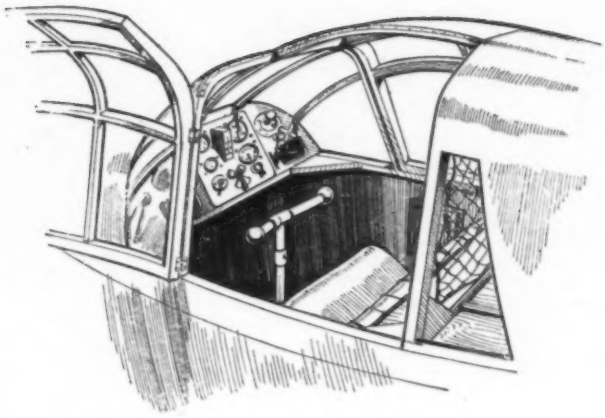
From these large existing or projected commercial types, there is a considerable drop in size to the next-largest commercial aeroplane actually shown; the Russian A.N.T.35. Generally following the Douglas formula, this machine, designed by A. N. Toupolev, is in the ten-twelve passenger class, and is of all-metal, metal-clad construction. The cabin provides quite roomy accommodation for ten passengers, the seating arrangement being of the orthodox type with a gangway down the centre. Two radial air-cooled engines called in Russia the M.85 type look very like Gnome-Rhônes built under licence and are rated at 850 h.p. each. It is claimed that they give the machine a maximum speed of 268 m.p.h. The engines are enclosed in long-chord cowlings carrying controllable flaps on their trailing edges in the approved modern fashion. The airscrews are three-bladers, of adjustable pitch. The gross weight of the machine is 14,500lb., the wing span 68ft. 3in., and the wing area 625 sq. ft. The wheels retract into the engine nacelles.

Not strictly speaking a commercial type, the other large Russian machine exhibited is the A.N.T.25. This machine, also of all-metal construction, is a single-engined monoplane of very daring design. Aerodynamic efficiency is the chief consideration in the layout of a long-range aeroplane, and in the A.N.T.25 the reduction of induced drag has been carried to the utmost extent, the wing span being no less than 112ft. As the wing area is 950 sq. ft., this represents an aspect ratio (defined as span-squared divided by area) of no less than 13.2. That Toupolev did succeed in constructing a cantilever monoplane of this aspect ratio in so large a size (gross weight 25,000lb.) is evidence of his skill as a designer. That it was worth while seems to be shown by the fact that the A.N.T.25 covered in non-stop flight over a closed circuit a distance of 9 374 km. (5,585 miles). The water-cooled engine of this machine is rated at 1,000 h.p.

In the main, it is left to the Caudron-Renault combination to represent the small commercial and feeder line class of aircraft at the show, not to mention the private owner type, of which this firm exhibits several examples. In sheer numbers the Caudron-Renault stand eclipses any other exhibitor, with seven types on view. In size and power these range from the C.448-449 *Goeland* through the *Typhon*, *Simoun*, Coupe Deutsch winner, *Rafale*, and *Ramier*, to the little *Aiglon*.

The *Goeland* is a fast twin-engined low-wing monoplane with accommodation for pilot and 6-8 passengers. The





(Left) The Messier retractable undercarriage on the Caudron Goeland.

Dual control is provided in the cabin of the little Benes Bibi-Be 550. There is side-by-side seating and a roomy luggage locker.

particular specimen exhibited is of special interest to British visitors by reason of a placard which announces that it has been purchased by Mrs. Amy Mollison. Fitted with two Renault engines of 220 h.p. each, the machine is credited with a top speed of about 190 m.p.h. and a range of 750 miles. Electrically operated Ratier v.p. airscrews are fitted.

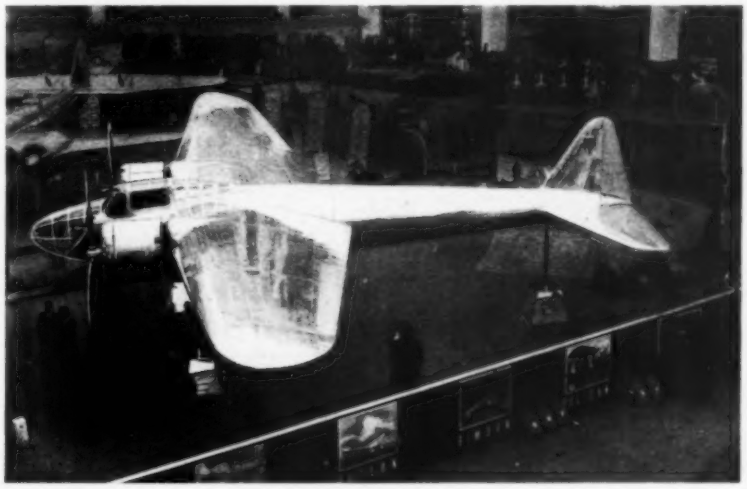
Generally similar to the De Havilland Comet, the Caudron *Typhon* is intended for fast air mail work. With two Renault Bengali engines the speed is stated to be 225 m.p.h and the range claimed is in excess of 3,000 miles.

Very comfortably equipped for pilot and three passengers, the C.635 *Simoun*, with a 220 h.p. Renault engine, has a maximum speed of more than 190 m.p.h. The C.800 *Ramier* is a small side-by-side enclosed two-seater, while the C.600 *Aiglon* is an open two-seater low-wing monoplane of classic design. The C.690 *Rafale* is a little cabin monoplane single-seater equipped with a wonderful set of instruments. It is intended for fighter training and has a speed of 230 m.p.h.

Czechoslovakia is represented by three civil types, of which two are shown together in the main hall, while the third is tucked away by itself under one of the galleries.

Ceskomoravska Kolben Danek S.A., of Prague, are showing a big brother of the Praga Baby. This machine, the Praga E.210, is a four-seater cabin monoplane, with dual controls and two Walter Mikron engines mounted in the trailing edge of the wing and driving pusher airscrews. It is of all-wood construction and looks as if it should be quite a comfortable machine, with the engines outboard and behind the occupants. In spite of the low power (two engines of 45-50 h.p. each) a speed of 143 m.p.h. is claimed, while the range is 370 miles.

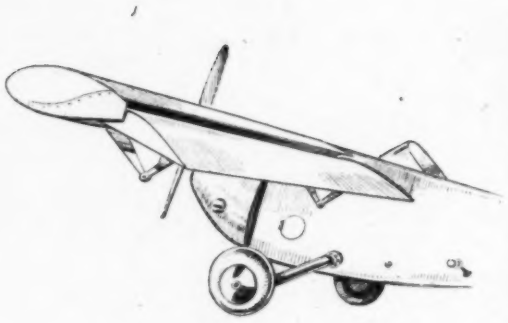
On the same stand as the Praga E.210 is a little low-power monoplane, the



The Amiot 341 mailplane (above) is exhibited with one Gnome-Rhône and one Hispano engine. This machine is credited with a speed of about 300 m.p.h.
(Left) The tiny Mignet H.M.16, which is claimed to be the smallest aeroplane in the world.

Bibi-Be 550, with side-by-side seating for pilot and passenger. Similar types did well in the Douze Heures d'Angers. The machine is the product of Benes-Mraz, of Chochen, Czechoslovakia. The designer is Mr. Benes who, it may be remembered, was co-designer with Mr. Hain in the old days when the Avia machines were produced by Milos Bondy. The Bibi-Be 550 is stated to do rather more than 100 m.p.h., and to have a range of 465 miles.

The remaining Czech civil aeroplane is a little two-seater sports type, the Zlin XII, with Persy engine of 45-50 h.p. The Letov general purpose biplane



The wing of the Kellner-Bechereau monoplane is slotted throughout its span, the slot being located approximately at mid-chord. Differential movement of the trailing edges provides lateral control.

shown adjoining the Praga and Benes-Mraz stand, is dealt with in the military aircraft section on an earlier page.

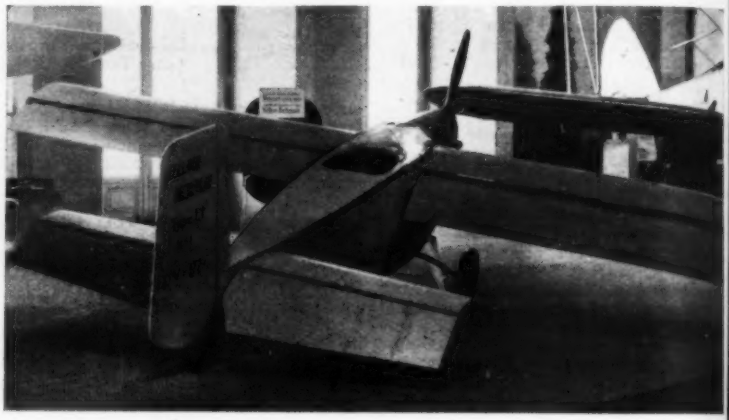
The new *Aviation Populaire* movement in France is represented by a large number of low-powered types, some shown together on one large stand under a gallery, others separately in odd corners and easily overlooked.

Henri Mignet is represented by three types: The H.M.18 "interceptor" which he has flown in England this year, the H.M.19 side-by-side cabin two-seater with nine-cylinder Salmson engine, and a very tiny type, the H.M.16, which he claims, according to the legend on the leading edge to be "the smallest aeroplane in the world." All three types show a new form of control in that all have the trailing edge of the rear wing hinged to form an elevator. The elevator is connected to the front wing control and is evidently designed to prevent the loss of control in a dive which has been found in the ordinary *Pou-du-Ciel*.

Most of the ultra-light and medium power machines of the light plane class are already well known to readers of *Flight*. The *Taupin* tandem biplane built under Louis Peyret licence is aerodynamically very similar to the Itford glider and to the aeroplane on which Maneyrol was killed at Lympne. The Mauboussin *Hemiptere* has already been described in *Flight* and an examination of the actual machine did not disclose any new information.

An interesting experiment is the Kellner-Bechereau E.1 with 40 h.p. Train engine. This is a single-seater monoplane with a fully slotted wing, the slot occurring almost in the middle of the chord and running the whole wing span so that the entire trailing edge is deflected for giving high lift, while differential operation of the two trailing edges gives lateral control.

The *Société Française d'Aviation Nouvelle* exhibit a new type, the S.F.A.N.5. This is a side-by-side two-seater, with the cockpit shielded by a large wide windscreen which sweeps up to the wing. Owing to the fact that the stub which carries the wing is "hollow ground" and the fuselage width narrows fairly abruptly behind the cockpit, there is an open gap on each side at the back, which should assist ventilation without causing draught in the cockpit. The engine of the S.F.A.N.5 is a Train of 60 h.p., mounted above the wing and driving a pusher airscrew.



Three-quarter rear view of the Kellner-Bechereau monoplane. This photograph, in conjunction with the sketch, explains the arrangement of the slotted wing of this unorthodox little machine.

DEATH OF SQUADRON LEADER de H. HAIG

EVERYONE connected with flying will be deeply grieved by the tragic death of Squadron Leader Rollo Amyat de Haga Haig, A.F.C., A.F.R.Ae.S., who was swept overboard from a yacht off Plymouth last week in a heavy gale.

Sqn. Ldr. Haig will be remembered for many things, not least for his feat in dropping off from the airship R.33 in a D.H. 53 light monoplane. Those who were at the series of Lympne meetings in the early days after the war will recall his skilful flying of the little Parnall Pixie. Later on, by way of a contrast, he put the enormous Beardmore Inflexible through its flying tests.

Born at Newcastle in 1896, Sqn. Ldr. Haig belonged to the same family as Earl Haig. He was educated at Clifton College, and joined the R.F.C. in 1916 soon proving himself a pilot of unusual skill. He served in France with various squadrons, and at the Armistice he became a test pilot at Martlesham. In 1924 he was appointed officer in charge of the experimental flying department at the R.A.E., Farnborough. In 1926 he left the Service and took charge of the flying department of the Beardmore firm. Then he became interested in the possibilities of the Monospar wing, and was one of the founders of the Monospar Company. Later on he was director of the International Aviation Agency. He was a founder member of the Guild of Air Pilots.

Forthcoming Events

November 13-29. International Aero Exhibition, Paris.
November 19. R.Ae.S. (Coventry Branch) Lecture: "The Lorenz System," by Mr. F. Tomlinson.
November 19. R.Ae.S. Lecture*: "Aerodrome Design," by Mr. Nigel Norman.
November 19. R.Ae.S. (Coventry Branch): Dinner and Dance.
November 20. South Coast Flying Club: Dinner and Dance, Grand Hotel, Brighton.
November 20. Eastbourne Flying Club: Dinner and Dance.
November 20. R.Ae.S. Students' Section: Informal Supper, "Ye Olde Cheshire Cheese," London, 8 p.m.
November 23. Brancker Memorial Lecture, "Empire Airway Organisation," by Mr. D. H. Handover; 6 p.m. Institution of Electrical Engineers, London, W.C.2.
November 27. Lancashire Aero Club: Annual Ball. Palace Hotel, Buxton.
December 1. R.Ae.S. Students' Section Lecture†: "Stressed-skin Construction," by Mr. C. Moore.
December 1. Colleges of Automobile and Aeronautical Engineering, Annual Dinner and Dance, Grosvenor House, London.
December 3. Herts and Essex Aeroplane Club: Annual Dinner and Dance, Park Lane Hotel, London.
December 3. R.A.F. Flying Club: Annual Ball at Grosvenor House, London.
December 10. R.Ae.S. Lecture*: "Civil Flying Boats," by Mr. A. Gouge.
December 15. R.Ae.S. Students' Section Joint Lecture with I.A.E. and I.P.T.: "Fuels for Aero Engines," by Mr. C. H. Barton. S.M.M.T., 83, Pall Mall, London, 7 p.m.
December 17. R.Ae.S. Lecture*: "Profile Drag," by Prof. Melville Jones.
December 18. London Aeroplane Club: Dinner and Dance, Park Lane Hotel, London.

*All R.Ae.S. lectures take place at the Royal Society of Arts, 18, John St., London, W.C.2, at 6.30 p.m. Admission is by ticket obtainable through a member.
†R.Ae.S. Students' Section meetings take place at 7 p.m. in the R.Ae.S. Library.

THE ROYAL AIR FORCE

SERVICE NOTES AND NEWS — AIR MINISTRY ANNOUNCEMENTS

GALLANTRY IN PALESTINE

The Air Ministry announces:—

The King has been graciously pleased to approve the following awards to the undermentioned officers and airmen of the Royal Air Force for gallant and distinguished services in connection with the emergency operations in Palestine during the period April 15 to September 14, 1936:—

Companion of the Order of the Bath (Military)

Air Vice-Marshal Richard Edmund Charles Peirse, D.S.O., A.F.C.

Companion of the Distinguished Service Order

Sqn. Ldr. Herbert Martin Massey, M.C.

Military Cross

Flt. Lt. Arthur Harold Owen.
Flt. Lt. Leslie Vincent Bennett.
F/O. Robert Gordon Yaxley.

Distinguished Flying Cross

Flt. Lt. Ronald William Macdonald Clark.
P/O. Richard Eric Burns.

Military Medal

L.A/C. Ronald Emerson Ross.

Distinguished Flying Medal

Sergt. Arthur Ernest Dale.

FORMATION OF NEW SQUADRONS

No. 78 (Bomber) Squadron formed at Boscombe Down on November 1. The unit is being equipped with heavy bomber type of aircraft and has been placed in the Bomber Command in No. 3 (Bomber) Group. The unit will move to Dishforth on January 7, 1937.

No. 166 (Bomber) Squadron formed at Boscombe Down on November 1. The unit is being equipped with heavy bomber type of aircraft and has been placed in the Bomber Command in No. 3 (Bomber) Group. The unit will move to Leconfield on January 7, 1937.

MOVES OF SQUADRONS

No. 10 (Bomber) Squadron will move from Boscombe Down to Dishforth on January 7, 1937.

No. 97 (Bomber) Squadron will move from Boscombe Down to Leconfield on January 7, 1937.

No. 230 (Flying Boat) Squadron was transferred from the Coastal Command to the Far East Command with effect from October 15, 1936.

R.A.F. STATION, HENDON

The administration of the R.A.F. Station, Hendon, together with that of the undermentioned units will be transferred from the Bomber Command (No. 6 (Auxiliary) Group) to the Fighter Command and placed in No. 11 (Fighter) Group with effect from December 1, 1936:—

No. 24 (Communication) Squadron
No. 600 (City of London) (Fighter) Squadron.
No. 601 (County of London) (Fighter) Squadron.
No. 604 (County of Middlesex) (Fighter) Squadron.

ROYAL AIR FORCE COLLEGE

The following flight cadets successfully completed on July 31 their course of training at the Royal Air Force College. The names are arranged in alphabetical order:—

Astley, P. M., Bangay, R. J. M., Barron, O. J. M., Bentley, A. M., Burges, G. (winner of J. A. Chance memorial prize), Chamberlain, P. B. (winner of Sword of Honour), Culverwell, F., Darling, V. C. (winner of Air Ministry prizes for Aeronautical Engineering and Humanistic Subjects), Fishwick, J. R., Fordham, J. W., Gibbs, R. P. M., Godfrey, O., Goodman, H. R., Greville-Bell, D., Humphris, J. H., Ingle, W. H., Inness, W. I. C., Jolliffe, P. S., Kerr, D. A. (winner of H.M. the King's Medal and Abdy Gerrard Fellowes memorial prize), Phillips, A. M. K., Powell, R. P. R. (winner of R. M. Groves memorial prize), Shand, W. P., Smith, C. D. S., Stevenson, M. G., Tait, J. B., Warcup, P. E.

EXPANSION PROGRESS

During the July-September quarter eight new squadrons were formed, of which three are light bombers, one medium bomber, three are fighters, and one is a general reconnaissance squadron. These new units brought the strength of the Metropolitan Air Force up to 79 squadrons with a first-line strength of 974 aircraft. The ultimate strength is to be 129 squadrons (109 Regular and 20 Auxiliary) with a first-line establishment of 1,750 aircraft.

Of the 2,500 pilots required by April next year, 500 have been obtained from inside the Service and practically the whole of the 2,000 needed from civil life have been enrolled. The total number of airmen accepted now exceeds 17,000.

KITE BALLOON EXPERIMENTAL STATION, PULHAM

The Kite Balloon Experimental Station at Pulham ceased to exist with effect from November 1.

R.A.F. BALLOON CENTRE

The R.A.F. Balloon Centre, Rollestone Camp, has been renamed No. 2 Balloon Training Unit with effect from November 1.

No. 2 Balloon Training Unit, together with Rollestone Camp, was transferred from the Fighter Command, No. 22 (Army Co-operation) Group, to the Training Command and placed in No. 24 (Training) Group on the same date.

R.A.F. STATION, BOSCOMBE DOWN

The R.A.F. Station, Boscombe Down, will be transferred within the Bomber Command from No. 3 (Bomber) Group to No. 1 (Bomber) Group with effect from January 7, 1937.

COMRADES OF THE ROYAL AIR FORCES

The sixth annual reunion dinner of the Association will be held at the Thames House Restaurant, Millbank, London, S.W.1, on Saturday, November 28, at 7.30 p.m. Dress will be lounge suits. Air Vice-Marshal C. A. H. Longcroft, C.B., C.M.G., D.S.O., A.F.C., will preside. All ranks of the Royal Air Force, whether serving, retired, or on the reserve, are eligible to attend, as well as former members of the Royal Naval Air Service and the Royal Flying Corps. Tickets at 4s. 6d. each, and full information, may be obtained from Mr. E. W. Phillips, Royal Air Force Station, Hendon, London, N.W.9.

R.A.F. STORES BRANCH—CHANGE OF TITLE

The Air Ministry is reverting to a war-time designation for those officers who handle and are responsible for the provision, maintenance and issue of the multifarious articles of highly technical and intricate equipment necessary to a modern air force; these include, in addition to aircraft equipment, armament, mechanical transport, marine craft and ground equipment. Since shortly after the fusion of the Royal Flying Corps and the Royal Naval Air Service in 1918 officers who have dealt with these items have been termed "Stores Officers." In future they will be known as "Equipment Officers" and their branch of the Royal Air Force will be similarly designated the "Equipment Branch."

The change, which is announced in a special Air Ministry Order—No. N. 713—issued on November 7, has, as is usual in such circumstances, received the approval of H.M. The King.

The development of aircraft in recent years has been so considerable that great as was the number of items of equipment ten years ago, the number to-day has increased to no less than 170,000. This is largely due to the additional and more complex requirements of modern types of aircraft. It is therefore felt that the old term of "Equipment Officer" more appropriately describes the duties than "Stores Officer," which, in the military sense of the term, has a more limited connotation.

Air Force stations throughout the world, from Bermuda in the West Indies to Hong Kong in the China Sea, must each hold *not* less than 4-5,000 different items—some have many more—and the number of articles at Royal Air Force stations varies from tens of thousands to a million. In the case of aircraft they vary from small turnbuckles, for regulating flying and landing wires, to fuselages, wings and complete aeroplanes; on the engine side from tiny grub screws to complete engines.

FORMATION OF STATION HEADQUARTERS

A station headquarters formed at Lympne on October 31. The station has been placed in the Bomber Command in No. 1 (Bomber) Group with effect from that date.

The formation of a station headquarters at Usworth on December 14 and the transfer of the station from No. 6 (Auxiliary) Group, has been postponed.

A CHANGE OF TERM

It appears from an Air Ministry Weekly Order that the term "floatplane" is not to be used any more, and the term "float seaplane" is to be used instead.

LONG SERVICE AND GOOD CONDUCT MEDAL

The Long Service and Good Conduct Medal has been awarded to the undermentioned airmen:—W/O.s Anns, J. T., Gracey, F. J., Jackson, J., May, H. A., Rabbitts, E. A., Waller, A. F. B., S.M.2 Kimpton, W. H. M., F./Sgts. Arnold, R. F., Ayre, A. H. J., Barr, H., Berry, C. N., Bowes, E. J., Bradley, D., Briggs, A. J., Canning. W. G., Casey, A. M., Chambers, F. A., Chandler, G. A., Colder, C. E. A., Corbett, D., Cotterell, F. P., Duncton, H. A., Elliott, A., Elvin, W. J., Forde, T. F., Gault, J., Hills, F., Hoad, C. E., How, A. W. D., Hulks, E., Jarvis, W. T., Judd, C. A., Kellaway, S. E., Knight, T., Laurie, C., Leeson, L. B. P., Matthews, H. P., McKay, J., Menness, L. J., New, A. H., Parsons, J. R., Plumb, R. G., Pyne, W. C., Rhys, G., Robbins, A. S., Round, J. Y., Rowed, G. T. E., Rudd, W., Seeney, F. T., Spinks, W. P., Vivian, E. J., Wilcox, F. A., Wilkinson, R., Wolfenden, W., Woods, A. G., Sgts. Anderson, F., Anderson, L. J., Andrews, S., Brittain, W. W., Charlesworth, P. A. V., Checksfield, A. C. H., Collins, F., Crisp, G. A. S., Cuff, E. R., Daniels, F., Davidson, F. D., M.C., Eatheley, F., Frankland, G. W., Gamble, W. E., Gledhill, G. W., Greaves, T., Grogan, T., Hall, E. G., Hammond, F. W., Healy, E. C., Henderson, L., Hickman, A. H., Jones, A. J., Kirkby, G., Lipscombe, W. T., Luxford, W. R., Marshall, F. L., Montgomery, N., O'Sullivan, T. P., Payne, C., Pestell, F. B., Preston, J., Pryke, R. S., Richardson, W. T., Sanderson, A., Silcox, W. J., Smart, A., Smith, A., Smith, E. T., Spurgeon, P. F., Stevens, W. A., Sutton, R. W., Swindlehurst, E., Tanner, R. D. C., Taylor, J., Ward, D. L., Weston, S. J., White, J. F., Youens, R. G., Cpls. Bass, W. F., Bottle, W. E., Bragginton, J. H., Brandon, H. T., Cpls./A./Sgt. Bray, C. S., Brown, W., Cavill, R. J., Clayton, H. L., Cpl. Cook, E. P., Cpl./A./Sgt. Corbett, J., Cpls. Cotton, W. G., Count, C. N., Currie, J., Davey, A. W. M., Derbyshire, P. W., Ellis, E., Cpl./A./Sgt. Endacott, G. W., Cpls. Frame, T. A., M.M., Frood, R. J., Gibson, D., Gladman, G. W., Cpl./A./Sgt. Grayer, W. R., Cpl. Hall, C. A., Cpl./A./Sgt. Hiom, F., Cpl. Holmes, H., Cpl./A./Sgt. Howard, V., Cpls. Jackson, J., Jones, T. I., Kemp, W. S., Knight, J. W., Lane, J. D., Larder, H., Loxton, G. H., Moffatt, E. W., Neal, A. H., Parsons, A. V., Pearce, F., Pearse, E. J., Pope, W. L. E. B., Purser, T., Queen, R. H., Rhodes, C. E., Richards, J., Robinson, G. F., Sheekey, J., Cpls./A./Sgt. Shinner, H. J., Shutes, L., Cpls. Simmons, R. E., Spicer, H. G., Stephenson, M. R., Cpl./A./Sgt. Taylor, A. W., Cpl. Timoney, P., Cpl./A./Sgt. Trim, E. G., Cpls. Trim, J., Vernon, F., Warne, H., Widdicombe, E. C., Cpl./A./Sgt. Willers, W. H., Cpls. Wintle, F. W., Yates, C., Yeoman, J., Cpl./A./Sgt. Yeoman, T. J., Cpl. Young, C. J., L./A./C.s Collier, E. E., Eccles, C. H., Lemon, P., Norburgson, A., Smith, D. R.

ROYAL AIR FORCE GAZETTE

London Gazette, November 10, 1936

The following Pilot Officers on probation are confirmed in rank (September 16):—A. W. Fletcher, J. H. Van.

The following Acting Pilot Officers on probation are confirmed in rank and graded as Pilot Officers on the dates stated:—B. G. L. Betbeder (August 6); G. C. Hyde, P. H. Rebbeck, R. K. Wildey (August 26); J. Adam, J. Culliford, A. C. Douglas, R. D. C. Gibson, H. S. Giddings, C. B. Hull, L. L. Hunt, R. G. Hurst, C. E. Johnson, G. D. Jones, B. P. King, D. J. McGlinn, W. H. R. N. Newton-Howes, R. H. Niven, R. Best, A. E. Pringle, M. L. Robinson, K. M. Sclanders, H. W. A. Sheahan, W. J. L. Stevenson, P. A. Tipping (September 16); P. G. D. Taylor (October 7).

The following Acting Pilot Officers on probation are graded as Pilot Officers on probation (September 16):—M. J. Loudon, R. R. S. Tuck.

The following Flying Officers are promoted to the rank of Flight Lieutenant on the dates stated:—E. G. Thompson (September 11); P. S. Gomez, with seniority June 19 (October 17); H. G. Lee (October 21).

The following Pilot Officers are promoted to the rank of Flying Officer on the dates stated:—A. J. Guthrie (October 16); N. F. Simpson, E. F. E. Barnard (October 30).

F/O. G. A. M. Pryde takes rank and precedence as if his appointment as Flying Officer bore date September 3, 1935, immediately following H. M. W. Thomas-Ferrand in the gradation list (reduction takes effect from October 2); P/O. T. S. Rivett-Carnac is restored to full pay from half-pay (November 1); Lt. G. K. Martyn, R.M., Flight Lieutenant, R.A.F., relinquishes his temporary commission on return to duty with the Royal Marines (July 2); the short service commission of Acting Pilot Officer on probation W. D. Sulis is terminated on cessation of duty (October 28).

Equipment Branch

Pilot Officer on probation C. J. Salmon is confirmed in rank and promoted to the rank of Flying Officer (September 6).

Accountant Branch

Pilot Officer on probation P. H. Roscoe is confirmed in rank and promoted to the rank of Flying Officer (September 16).

Commissioned Engineer Officers

The following Warrant Officer is granted a permanent commission as a Flying Officer on probation with effect from and with seniority of October 26:—E. T. McKeown.

PRINCESS MARY'S ROYAL AIR FORCE NURSING SERVICE

Sister Miss I. F. Clark resigns her appointment (September 25).

ROYAL AIR FORCE RESERVE

Reserve of Air Force Officers

General Duties Branch

F/O. H. E. F. Saunders is granted a commission as Flight Lieutenant in Class C (October 5); F. H. L. Searl is granted a commission as Flying Officer in Class C (November 10).

The following Pilot Officers are promoted to the rank of Flying Officer on the dates stated:—A. J. Hagger (June 8); B. E. A. Pollard-Urquhart (August 20); E. L. Gosling (September 10).

Flt. Lt. G. R. Jackson is transferred from Class A to Class C (June 17); F/O. G. J. S. Chatterton is transferred from Class A to Class C (September 6); F/O. J. A. S. Hodgson is transferred from Class AA (ii) to Class C (July 20); F/O. K. V. Garside is transferred from Class C to Class AA (ii) (April 22).

The following Flying Officers relinquish their commissions on completion of service:—D. A. L. Campbell (October 29, 1935); E. L. Purdy, M.C. (September 16).

F/O. S. Jones, D.F.C., relinquishes his commission on completion of service and is permitted to retain the rank of Flight Lieutenant (August 14). (Substituted for the notification in the *Gazette* of September 29.)

SPECIAL RESERVE

General Duties Branch

F/O. J. R. T. Bradford resigns his commission (May 1).

AUXILIARY AIR FORCE

General Duties Branch

No. 500 (County of Kent) (Bomber) Squadron.—G. G. Stockdale is granted a commission as Pilot Officer (September 19).

No. 600 (City of London) (Fighter) Squadron.—T. D. Craven is granted a commission as Pilot Officer (September 17).

No. 604 (County of Middlesex) (Fighter) Squadron.—F/O. M. D. Doulton relinquishes his commission on completion of service (September 29).

No. 610 (County of Chester) (Bomber) Squadron.—M. C. Topham is granted a commission as Pilot Officer (October 9).

AUXILIARY AIR FORCE RESERVE OF OFFICERS

General Duties Branch

The following are granted commissions as Flying Officers in Class A with effect from the dates stated:—J. R. T. Bradford (May 1); M. D. Doulton (September 29).

November 3

Accountant Branch

Pilot Officer on Probation C. W. S. Jones is confirmed in rank and promoted to Flying Officer (September 16).

Medical Branch

Flt. Lt. C. G. Harold, M.B., B.Ch., is placed on the half-pay list, Scale A, from October 6 to 12 inclusive.

Memorandum

Capt. the Marquess of Cholmondeley is permitted to retain the rank of Major with effect from March 20, 1920.

ROYAL AIR FORCE RESERVE

Reserve of Air Force Officers

General Duties Branch

R. E. M. Blakeway is granted a commission as Pilot Officer in Class AA (November 3).

The following Pilot Officers on probation are confirmed in rank with effect from October 4:—E. Goldsmith, G. E. Lowdell, A.F.M., A. R. O. McMillan, W. L. B. Palmer, W. J. Alington.

The following Flight Lieutenants are transferred from Class A to Class C on the dates stated:—H. L. Andrews (October 31), K. E. Parker (November 1).

The following Flying Officers are transferred from Class AA (ii) to Class C on the dates stated:—H. C. Barrett (February 15), R. L. Moss (July 6).

F/O. K. C. Cooke is transferred from Class AA (ii) to Class C (May 25, 1935). (Substituted for the notification in the *Gazette* of March 10.)

SPECIAL RESERVE

General Duties Branch —

P/O. R. A. Lowe resigns his commission (May 1).

AUXILIARY AIR FORCE

General Duties Branch

No. 609 (WEST RIDING) (BOMBER) SQUADRON.—D. Persse Joynt is granted a commission as Pilot Officer (August 29).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Wing Commander.—E. D. Davis, to Directorate of Technical Development, Air Ministry, vice Wing Cdr. C. H. Keith, 29.10.36.

Squadron Leader.—F. R. D. Swain, to R.A.F. College, Cranwell; for flying duties in Advanced Training Squadron vice Sqn. Ldr. M. H. Garnons-Williams, 28.10.36.

Flight Lieutenants.—W. N. Ash, to No. 40 (B) Squadron, Abingdon, 20.10.36. R. J. Bennett, to No. 204 (F.B.) Squadron, Mount Batten, 26.10.36. G. R. Canavan, to No. 210 (F.B.) Squadron, Pembroke, 19.10.36. H. R. L. Hood, to No. 23 (F) Squadron, Biggin Hill, 26.10.36. R. V. McIntyre, to No. 41 (F) Squadron, Catterick, 26.10.36. D. I. P. Macnair, to No. 2 Armament Training Camp, Aldergrove, 15.10.36.

Pilot Officers.—J. B. Brolly, to School of Air Navigation, Manston, 21.10.36. H. I. Edwards, to No. 15 (B) Squadron, Abingdon, 24.9.36. T. F. Harvey, to No. 18 (B) Squadron, Upper Heyford, 24.9.36.

Acting Pilot Officers.—The undermentioned are posted to the R.A.F. Depot, Uxbridge, on appointment to short service commissions as Acting Pilot Officers with effect from 10.10.36:—L. H. Baker, W. B. Baxter, A. R. H. Beauman, J. N. Bell, J. C. H. Blake, E. D. Chantler, E. G. F. Chivers, K. B. Corbould, C. T. V. Craxton, J. W. B. Davis, B. O. Dias, J. A. L. Fowler, J. W. Fordham, J. A. Ingram, R. H. James, B. R. Kerridge, F. L. Litchfield, D. H. Lowe, A. McPherson, C. Murray, J. R. S. Romanes, E. N. Ryder, J. H. Sanderson, M. A. Scott, G. E. Thompson, R. H. Thompson, A. L. Vipan, E. G. Winning and R. S. C. Wood.

Stores Branch

Pilot Officer.—B. O. Cannon, to No. 4 (A.C.) Squadron, South Farnborough, 28.10.36.

Accountant Branch

Squadron Leaders.—L. de L. Leder, to R.A.F. Station, Cranwell; for Accountant duties vice Sqn. Ldr. W. R. Westcombe, 14.10.36. E. V. Humphrey, to R.A.F. Station, Andover; for Accountant duties vice Sqn. Ldr. L. de L. Leder, 12.10.36.

Flight Lieutenant.—W. S. Calder, to R.A.F. Station, Mount Batten, 23.10.36.

Medical Branch

Wing Commander.—C. T. O'Neill, to Headquarters Coastal Command, Lee-on-the-Solent; for duty as Deputy Principal Medical Officer, 24.10.36.

Chaplains Branch

Revd. O. R. I. Jones, to No. 9 Flying Training School, Thornaby; for duty as Chaplain (C. of E.), 28.10.36. Revd. C. J. F. Gilmore, to R.A.F. Depot, Uxbridge; on appointment to a short service commission with effect from 14.10.36.

November 3

Stores Branch

Wing Commander.—T. G. Skeats, to Headquarters, R.A.F. Iraq, Hinaidi; for Equipment Stores Staff duties vice Wing Cdr. W. E. Aylwin, O.B.E., 24.10.36.

Squadron Leader.—H. E. T. Crocker, to Aircraft Depot, Hinaidi, Iraq; for Stores duties vice Sqn. Ldr. A. W. Smith, 24.10.36.

Flight Lieutenants.—P. H. Burt, to Stores and Supplies Depot, Steamer Point, Aden, 24.10.36. E. A. Slater, to No. 55 (B) Squadron, Hinaidi, Iraq, 24.10.36.

Flying Officers.—R. A. Howes, M.B.E., and E. H. Free, to Aircraft Depot, Hinaidi, Iraq, 24.10.36. A. H. McM. Hely, to Headquarters, R.A.F., Hinaidi, Iraq, 24.10.36.

Pilot Officer.—C. J. Salmon, to No. 70 (B.T.) Squadron, Hinaidi, Iraq, 24.10.36.

Accountant Branch

Squadron Leader.—H. W. Capener, to Aircraft Depot, Hinaidi, Iraq; for Accountant duties, 24.10.36.

Flight Lieutenant.—T. C. Reep, to Headquarters, R.A.F., Hinaidi, Iraq, 24.10.36.

Flying Officer.—R. Peel, to Aircraft Depot, Hinaidi, Iraq, 24.10.36.

Medical Branch

Squadron Leader.—P. B. L. Potter, to R.A.F. Hospital, Aden; for duty as Medical Officer, 24.10.36.

Flight Lieutenants.—C. G. Harold, to Aircraft Park, Lahore, India, 24.10.36. A. Sheehan, to No. 2 (Indian Wing) Station, Risalpur, India, 24.10.36.

Dental Branch

Flight Lieutenant.—K. G. Swiss, to R.A.F. General Hospital, Hinaidi, Iraq, 24.10.36.

Flying Officers.—C. H. Beamish and E. Martin, to No. 1 School of Technical Training (Apprentices), Halton, 26.10.36. L. C. Bellsham-Revell, to Air Armament School, Eastchurch, 26.10.36. A. C. Wilkie, to Home Aircraft Depot, Henlow, 26.10.36.

Chaplains Branch

Revd. G. M. Rees, to R.A.F. Station, Amman, Palestine, 24.10.36. Revd. G. W. N. Groves, to Headquarters, R.A.F., Hinaidi, Iraq; for duty as Chaplain (C. of E.), 24.10.36.

Shadow Industry Developments

IN the House of Commons last week Mr. Chorlton asked the Under-Secretary of State for Air whether he would give the value of contracts placed in the Coventry and Birmingham area for aero engines and parts during the last six months and how much in total was involved in the proposed new factories.

Sir Philip Sassoon, in his reply, said that the value of the contracts mentioned was £2,053,982, and the cost of building and equipping the proposed new aero engine factories would probably be in the region of £2,600,000.

According to the *Midland Daily Telegraph*, the Standard factory, the first to be started, has now reached an advanced stage; most of the steel work is in position and part of the roofing has been completed. There is no doubt that the building will be finished according to schedule.

Equally fast progress has been made at the huge Daimler factory adjoining the old war-time Radford aerodrome.

The Humber factory, situated in Aldermoor Lane—when completed it will take up all the available land between this road and the Hillman test track—has been somewhat delayed by the wet weather interrupting work on the foundations.

An Engineering Directory

FACTORY executives who wish to have a means of easy reference to the activities of engineering firms and makers of parts would do well to investigate the claims of *Kelly's Directory of the Engineering, Hardware, Metal and Motor Trades*, the 22nd edition of which has recently been published.

The directory, a truly monumental work of nearly 3,000 pages, comprises the following information: (1) The names of firms in each county, arranged alphabetically under the towns and villages; (2) an alphabetical classification of trades for the London Postal District, with the names arranged under each trade heading in alphabetical order; (3) a similar classification of trades for the rest of England, Scotland and Wales.

There are also the following special sections: (1) An alphabetical list of the names of some 10,000 branded articles and specialities used in the engineering and allied trades, together with the names and addresses of the manufacturers; (2) an alphabetical list of the names (with addresses) of the manufacturers of iron and steel sections, plates, sheets, etc., arranged under their various classifications, together with the sizes, etc., made by each; (3) a list of various brands which appear on iron and steel work, together with the makers' names and addresses.

The directory, which may be obtained through local booksellers, price £2 10s., is published by Kelly's Directories, Ltd., 186, Strand, London, W.C.2.

Business as Usual

FROM one of the paragraphs in last week's section of the British Aircraft Industry Number dealing with general work, it would have been gathered that, though likely to be in action very soon, the Brooklands workshops were temporarily at a standstill after the fire. Capt. Duncan Davis has written to say that Brooklands Aviation has now been working overtime for a fortnight or so. We under-estimated the Brooklands capacity for quickly replacing the straw from which bricks are made!

Correspondence

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases, accompany letters intended for publication in these columns.

THOSE CIRCUITS

TEN years ago I spent about a fortnight with a German flying school. Winter; the aerodrome snow-covered. The age of the pupils varied from 17 or 18 to 40 or 50. My knowledge of German was, and is, sketchy. I attended one lecture and understood one word—*moteur*. The machines were low-wing 20h.p. monoplanes. The pupils did all the fatigue work connected with them. Their flying began with circuits, but only three in the morning and another three in the afternoon. Every flight was recorded in a book kept by the pupil on duty at the time. When the instructor thought a pupil fit he loosed him on his first solo—a circuit. The pupils had never flown anything else. Four hours saw most of them do that solo. The instructor would mutter "Brigand!" when the landing was made on one wheel, but when the pupil taxied up would say, "Very good. Take her round again." "*Fliegen heisst Landen*," he said to me. "*In Deutschland, ja*," I answered, "*aber, in England, Fliegen heisst Warten*." Waiting is worse than circuits!

CANTILEVER.

Norfolk.

CAR-ENGINED AIRCRAFT

I THINK "Indicator's" remarks in *Flight* of November 5 call for comment. As explained by him, the chief reason why automobile motors can be secured at a lower price than aircraft motors is that the former are made in mass production on a large scale; this we will all agree upon. Nevertheless, if with a few simple alterations an auto engine can be utilised in a certain type of aircraft, why not take advantage of the situation to the benefit of the Little Man who desires to fly?

"Indicator" suggests that an aircraft motor can be secured for about another £100. Supposing it *were* as little as this, in the first place; I can assure all interested persons that the maintenance and replacement costs of the car engine will be less than 25 per cent. of those of an aircraft motor, and may I add that this item requires serious consideration when purchasing an aeroplane? Do not take my word for it; ask any private owner.

The certain type of aircraft to which I refer is the two-seater for a private owner who flies for the pleasure of flying and not for hire or reward. Therefore pay-load is not a serious consideration; and for a training machine where it is not necessary to carry luggage at all, and as most training is carried out in the vicinity of an aerodrome, the limited amount of fuel carried need not be seriously considered.

In the case of the Wicko, two persons are carried and, in addition, 45lb. of baggage with a cruising range of 250 miles at a speed of 100 miles per hour; this, I think, is a very creditable performance for a low-price machine.

As to "Indicator's" remarks about the mental comfort. If a car engine stands up to the rigid test laid down for aircraft motors, why shouldn't it be just as good and reliable as they are?

In the case of the Ford V8 converted by the Arrow Aircraft Co., of America, the motor stood up to 50 hours running on *full* throttle with an average speed within plus or minus 3 per cent. of the proposed rate of speed, and 50 hours at 75 per cent. of the proposed rate of power at propellor load speed; it now holds a Department of Commerce Approved Type Certificate No. 151.

At an early date the Wicko Ford conversion will be submitted for a British type certificate. This, however, only calls for 50 hours at seven-eighth full throttle and 50 hours with a calibrated airscrew.

To date the Wicko has flown nine hours and carried thirty passengers. The Ford V8 is functioning perfectly in its capacity as an aero motor.

"Indicator" errs in his statement that the Ford engine is the only make to be used in aircraft. I might mention that the Plymouth auto engine has recently been used in a Fahlin Monoplane in America.

London, E.3. Foster, Wikner Aircraft Co., Ltd.
G. N. WIKNER,
Technical Director.

THE PRIVATE OWNER'S IDEAL

LIKE most newspaper readers I am bombarded with accounts of records celebrating the cult of speed. In aerodromes I have to learn the use of flaps, forced on me because certain machines, built for speed, cannot get down comfortably without them. I am informed also that the "only thing" which the air-transport companies have to sell to the public is speed! I should have thought that a goodly number of travellers enjoy the marvellous views which are offered them—views failing which they would not wander by air at all. Directors, pilots and people in a hurry think otherwise. On the other hand there are those who, like Lord Cardigan (*Daily Sketch*, June 9, 1936, "Now for some Slow-Flying Records, Please"), consider speed an overrated luxury and very fast, small machines as unpractical and dangerous, condemning "a man-driven projectile shooting somewhat precariously from one remote aerodrome to another." [Mr. R. A. C. Brie made a very similar point in a letter in *Flight* of November 5.—ED.]

And our wise counsellor "Indicator," always a progressive and acute critic, would apparently scrap the conventional small, fast aeroplane. He suggests as an ideal for designers "a minimum forward speed of not more than 10 m.p.h.; a gliding or approach angle which could be varied from 1 in 2 upwards; an undercarriage which would take a shock descending vertically at 20 m.p.h.; and so on." The first example, he suggests, might have a maximum speed of 70 m.p.h. (*Flight*, October 15). Well; the needs of warriors and men of business cannot be ignored, but the joy-flyers also must have their say. We have to get rid of a lot of flying ideals thrust on us by the war. We want to amuse ourselves fully and not ride on projectiles which in difficult country entail a long-drawn-out gamble with death.

Flying light aeroplanes, judged by the severe standards of good skating and mountaineering, is not a difficult art; it is one, in fact, suitable for elderly folk who can show a clean bill of health. This is because we draw mainly on our brains and nerves; like Wells's Martians, we control a mechanism which asks of us no muscular exertion worth the name. Even blind flying and stunts can be enjoyed after the sixties, while navigation is a perennial source of pleasure. Speed also is enjoyable at times, though it may be found that all aeroplanes travelling high up seem to be going slowly! But the supreme thrills of flight, as experienced in fine weather in a country like Switzerland, presuppose neither stunts nor high speed, while navigation is ordinarily a very simple affair. "Indicator's" 70 m.p.h. (and under) will provide all the speed which is necessary. Ability to travel and glide slowly amid and over mountains, above lakes, glaciers and valleys is the essential; even a good machine such as the Leopard Moth hurries one too quickly over the face of Nature. Have we available any machines which promise to do better? Yes; the Swallow and the Drone de Luxe among others. The fetish of speed is not worshipped and the joy-flyer can take his fill of beauty at minimum risk. But of course "Indicator's" ideals cannot be realised at a stroke.

There are times and places for conventional aeroplanes and high speeds, but there are many forms of flying in which slow going, slow landing, a pusher engine (with no troublesome slip stream) and a perfect outlook are indispensable to the sane flyer. War and business—thank Heaven—do not exhaust human interests.

DOUGLAS FAWCETT.

Switzerland.

Coventry Aero Engines Issue

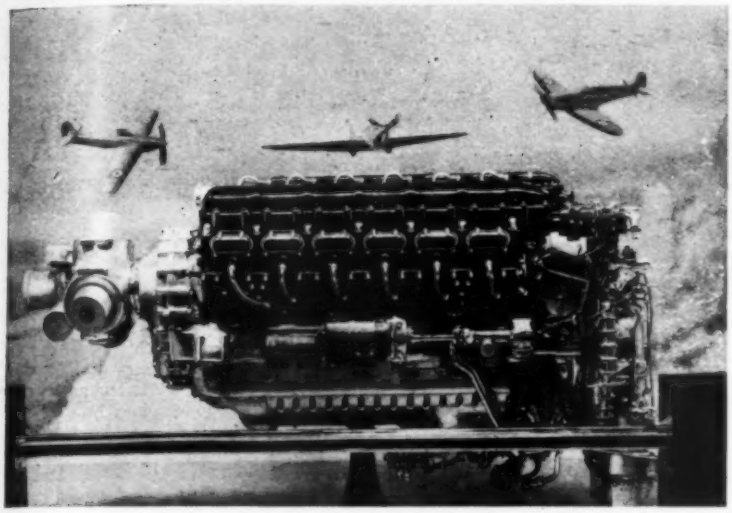
NEGOTIATIONS are nearing completion for a public issue of ordinary shares in Coventry Aero Engines and Components, Ltd., which is expected to be made shortly.

The company has been formed to acquire the exclusive licence to manufacture and sell within the British Empire the Lorraine engine, which has attained considerable popularity in the aircraft and marine engine field, particularly abroad.

The issue will be sponsored by the Commercial and General Finance Trust, Ltd.

NEAT POWER

Engines at the Paris Aero Show



The Rolls-Royce Merlin engine, handsomely displayed and set off by a *Flight* scenic composite enlargement. (*Flight* photograph.)

AMONG British aero engine manufacturers the usual practice is for each maker to concentrate on one type of engine only; for example, on a radial, a liquid-cooled vee, or an inverted, in-line, air-cooled or ultra-light type.

In France, however, this is not the case, as is demonstrated by the Aero Show displays. It is quite usual to find on one stand a range from air-cooled twins to inverted six-in-lines, together with radials of from 150 to 700 h.p., and one or two vee engines as well.

The air-cooled, inverted vee type seems to be finding favour abroad; examples, all between 400 and 500 h.p., are offered by Renault, Farman, Walter and Salmson. The last-named, of 450 h.p., is fitted with a new between-bank air-scoop and twin overhead camshafts, while the reduction gear is designed for an airscrew-boss cannon mounted above the crank case.

Great interest is being shown in the Rolls-Royce Merlin F engine, with power stated for the first time as 1,065, while the Bristol stand is a centre of attraction with a sectioned, working Pegasus, and a partly sectioned display assembly of a crankshaft, reduction gear and supercharger.

On the Gnome Rhône stand two new engines of special interest are shown, the 14 M and 18 L. The former is an unusually compact two-row, fourteen-cylinder radial engine of 38in. diameter, giving 650 h.p. at 4,000 metres or 13,100ft., for 904 lb. weight. In direct competition with this engine is the fourteen-cylinder 39¼in. diameter Hispano Suiza 14 AB of 680 h.p. at 11,500ft., weighing 1,014 lb.

Among the Armstrong Siddeley exhibits are Tiger IX and Cheetah IX. The former, with D.H. variable-pitch airscrew, is ordered in large numbers by the Air Ministry for the A. W. Whitley bomber, and by Imperial Airways for the A.W.27. The Cheetah IX is shown with Ratier constant-speed airscrew, but will be supplied for the Airspeed twin-engined trainer with D.H. V.P. equipment.

Of English light engines, the latest Cirrus models are on show.

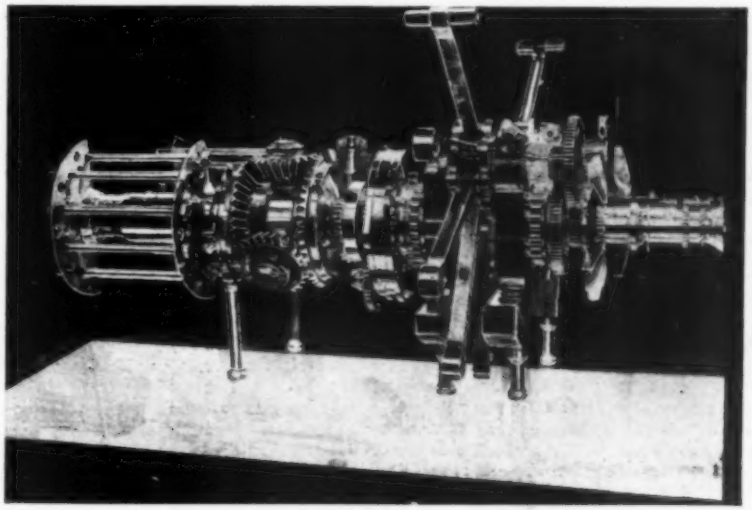
It is noticeable that the Gnome Rhône K.14fs and K.14drs are the power units of many aircraft displayed, both production machines and prototypes. The licence to build these and other Gnome Rhône models is held in England, Italy, Czechoslovakia, Russia, Japan, Jugoslavia, Roumania and Portugal.

On the Regnier stand an inverted six-cylinder air-cooled engine, type R-6, is displayed with a Roots' blower, giving 250 h.p. nominal output at 6,550ft., the rated altitude being 13,100ft.

Surprise was caused by the mention in the catalogue of the Hercules engine in the Bristol section and Mastiff engine in an Armstrong Siddeley advertisement.

An unusual 475 h.p. Lorraine engine built under Potez licence has twelve horizontally opposed air-cooled cylinders. The blower is located horizontally below the crank case.

The various engines will be fully reviewed in *Flight* next week.



This shining assembly, an example of the "movement" of Bristol engines, is reminiscent of a watch mechanism. (*Flight* photograph.)

PARNALL PROGRESS

AT the first ordinary general meeting of Parnall Aircraft, Ltd., held in London last week, Sir Louis Vaughan, K.C.B., K.B.E., D.S.O. (the chairman), who presided, said they had two separate claims against the Air Ministry. The first was for patents assigned to the Secretary of State for Air and for development work prior to the incorporation of Parnall Aircraft, Ltd. The second related to development expenditure incurred by the company. He could not give shareholders any further information regarding the first claim, but they had no reason at present to doubt that it would be settled amicably.

The receipt of very large contracts had made it necessary to increase their manufacturing facilities, and to-day they ranked second to none in the importance of the work they were undertaking.

Private Flying

Topics of the Day

At the Show

As we know light aeroplanes there was not a great deal of interest at the Paris Salon, since most of the floor-space was devoted to a display of efficient killing machinery. One saw, however, some ultra-lights of considerable merit, though some of them would be laughed aside by enthusiasts in this country as being either a little too unorthodox or a little too haywire. One of them, the Farman Moustique, was first made just after the War.

Curiously enough, among the most workmanlike little machines were the H.M.18 and 19—*Poux*, if they can still be called *Poux*. One is the single-seater cabin machine which has been seen over here quite a lot, and the other a side-by-side type with the same layout. Unorthodox but interesting were the S.F.A.N. pushers, and the Volland biplane with a stagger of the most prodigious nature. One of the pushers has been brought over here by Col. Fitzmaurice and is, I learn, to be made in this country; the other is a side-by-side high-wing job, looking like a large and more expensive Drone.

Towards an Ideal

In the larger sizes there was something on the Czech stand which might have been usefully examined by any of our light-aeroplane manufacturers. A high-wing cabin four-seater with two *pusher* engines faired into the trailing edge. The view from the side-by-side pilots' seats appeared to be perfection itself, though I should not have thought that there was quite enough elbow room for two people with two spectacled control columns. This machine, the Praga 210, might be a worthy big brother to the little Praga, which is already being made in this country.

The Caudron Simoun is well known here and was practically the only example of the private cabin machine as we know it to be seen at the Show. The Caudron Ramier appeared to be a side-by-side low-wing monoplane, but it was placed out of reach and could not be properly examined. Though laid out as a fighter-trainer of the new type, with sights and camera gun, the Caudron Rafale on exhibition was a truly delightful little single-seater with an array of instruments and gadgets which would have alarmed most of our simpler-minded amateurs—who would be even more alarmed by the pull-open throttles which are standard on all French machines.

Judging from the ultra-light, glider and model exhibits, the French people are attacking this amateur flying business from the bottom end, and by way of inexpensive air sport we have the parachute training tower—à la Russe. Perhaps it would be fairer to say that they are attacking it, Gallic fashion, from the logical end—in developing machines which the normal young man can afford to fly a great deal and not just when he has a few pounds to spare or when he discovers that the date for the licence-renewal is perilously close.

Simplified Control

A WEEK or two ago I spent an interesting half-hour in the air with one of our more easy-to-fly aeroplanes while making a series of minor experiments in one- and two-control flying, and actually made one circuit without using the rudder at all while actually flying. Only the fear of a trailing wing-tip caused me to use it even on the ground.

Turns up to the vertical could be made on ailerons alone, with the side-slip needle of the turn-and-bank indicator central save when a turn was actually being started, steepened too suddenly, or reversed without reasonable caution. One take-off was made with my feet on the floor, but the machine swung through, perhaps, twenty degrees.

Another take-off was made on the rudder alone, but it was necessary to organise the fore and aft trimming lever both to get the tail reasonably well up while gathering speed and to ease the machine off the ground. Thereafter, the stick was not touched until the approach, when the presence of large numbers of training machines necessitated a certain amount of quick manœuvring. It was possible to keep the nose up, on all but steep turns, with the help of the trimming lever, though the machine's progress through bumpy air was a somewhat devious one, since the rudder was being used to keep the machine level laterally.

About a year ago I flew a perfectly normal training machine in loops and steep turns with a rudder movement limited, by accidental means, to a matter of two inches at the trailing edge. It was not until I attacked a stalled turn that I discovered the trouble. No wonder the business of instruction consists so largely of indirect lessons in the proper use of the rudder!

The Trend of Development

MOST of which suggests that, without resorting to experiments in the unorthodox, the design of the normal light aeroplane is such that flying is becoming a good deal easier. When a little more experience has been gained of the Hornet Moth, for instance, it will be interesting to compare the average dual times with those for the conventional trainer, and in the Miles Straight Special we have another type which may reduce the apprenticeship period to a marked extent. The B.A. Swallow has already proved its training value.

It is, on the face of it, quite ridiculous that a newcomer should need to be nursed for anything up to fifteen hours in the air before being considered even tolerably safe for the duration of a five-minute circuit. My logbook dual total, including, of course, quite a lot of flying as a second pilot in big machines, is of the order of sixty hours, though I actually went solo after about ten hours spread over a period of four months on Cirrus I Moths—with high-pressure tyres and straight-axle undercarriages.

INDICATOR.

FROM the CLUBS

Events and Activity at the Clubs and Schools

HATFIELD

NEW members are Mrs. Bowles, Messrs. D. Howell, J. C. Reynolds, C. D. Strickland, N. G. Bennett, G. S. Parker and I. C. Pemberton. Flying time for the week ended November 8 amounted to fifty-eight hours, while that for last week only reached twenty-six hours owing to the high winds.

REDHILL

Cross-country flights during the week included trips to Reading, Cambridge, Ford and Brooklands. The Puss Moth has flown to Paris for the Aero Show and there are five new members. Flying time logged for the past fortnight totalled 76 hr. 10 min.

SOUTHEND

In spite of high wind some advanced cross-country flights have been successfully carried out. Delivery of the Club's new Tipsy, which will enable members to get in flying times at a very much reduced rate, is expected daily. The monthly Club supper and smoking concert will be held to-morrow (Friday) at 8 p.m.

YAPTON

Flying times for November to the 14th totalled thirty-nine hours. New members are Messrs. Gilbert Lancaster, R. A. Hubbard and L. Manibl, all three taking the £15 "A" course. Mr. Frank Miller and Mr. Jack Lauderdale have passed their "A" licence tests, and Mr. Donald Prentice made a cross-country flight for his "B."

CAMBRIDGE

During the past fortnight the flying times at Marshalls' Flying School totalled 146 hr. 40 min. First solos have been made by Messrs. Danby, Mitchell, Hignett, Sisson and Blackburn, and Mr. Mitchell has obtained his "A" licence. Four members of the School are busy taking their "Bs" and three members are taking their second-class navigator's licence. Messrs. Charters and Bridge have joined the School.

SCOTTISH

During October members of the Scottish Flying Club put in 119 hours, no solos being made on account of bad weather. During the month members of the newly formed Glasgow Transport Department Flying Club started training at Renfrew. The recent gales blew in the workshop hangar and caused considerable damage to three machines. The Club's annual ball was held at the Central Station Hotel, Glasgow, on November 13.

LEICESTERSHIRE

The very successful dance, held in the clubhouse on October 30 was attended by some 120 members and their friends. Messrs. R. C. Winn, D. D. Longmore and S. Brown flew over to Kineton aerodrome on October 25 and had lunch with Lord and Lady Willoughby de Broke, Mr. E. A. Underwood and Mr. R. Crawford Johnson proceeding by road. The Leicestershire Aero Club put in 58 hr. 35 min. flying during October. New members are Miss H. M. Corner, Messrs. H. A. Smith, E. Salzmann, S. P. Russell, and Capt. E. O. Kellett. Mr. D. C. H. Weir has gone solo.

HANWORTH

The Club has acquired another Gipsy I Moth and this machine will shortly be available for instruction and hire. During the past fortnight flying times amounted to 111 hours and "A" licence tests have been passed by Messrs. T. Thurston and L. Fowler. Mr. R. Henderson, a private owner, is completing tests for his "B" licence. New members are Messrs. T. Fitzgerald, C. Hatry, J. Fruin, J. A. Sargeant, T. Thurston, J. A. C. Warren, E. O. Thurston, J. H. Sargeaunt, L. Sargrera, Norman Cave, D. E. W. Pugh, E. L. Hakansson, R. Matthews, J. Willmott, and L. Willder.

BORDER

Miss Arckless and Miss Evans have both carried out successful first solo flights. Each started instruction at about the same time and this fact resulted in a "race." Only fifteen minutes divided them at the end, Miss Arckless winning with Miss Evans following on the very next flight. The Club held its annual general meeting recently with Mr. Harold Carr, President, in the chair, and there was a good attendance of members. Mr. Taylor has passed his altitude and "A" licence tests and new members include Messrs. Steele, Williams and Tassell. The Club is holding its annual cabaret ball on November 25.

MIDLAND

The landing competition, for which the *Evening Despatch* trophy was awarded, took place on Sunday, November 8, and was won by Mr. G. Duttson, with Mr. L. Hodgson second, and Mr. J. G. G. Wilkinson third. Miss G. L. Haller, Messrs. A. Wood, K. J. Bartlett and A. W Perkins have joined the Club as ordinary members, and Mr. G. G. Knight as a flying member. Cross-country flights have recently been made to Heston, Portsmouth, Hanworth, Walsall and Braunstone. Mr. W. H. Lord has passed his "A" tests, while Messrs. K. Lister and S. Lunt made first solos.

C. A. S. C.

Messrs. Lewin and Ellis have taken their trial flights with the Corps, and in spite of high winds members have put in fifteen hours' flying during the past two week-ends.

YEADON

During the fortnight ended November 8 the flying time of the Yorkshire Club totalled 42 hr. 10 min., while a total of 144 hr. 30 min. was recorded for the month of October, this showing an increase of over 100 per cent. on the total for October of last year, which was 70 hr. 20 min. Mr. J. A. Smith, an Aviation Group member, has gone solo.

PORTSMOUTH

The total flying times for the week ended November 6 amounted to 17 hr. 50 min., high winds and generally bad weather accounting for the loss of flying hours. The second monthly dance was held on Wednesday, November 4, in the clubhouse, about eighty members and their guests being present. F/O. G. B. S. Coleman is shortly joining the Club as assistant flying instructor and Mr. W. T. Fisher has become a member.

NOTTINGHAM

Flying time for the week ended November 5 amounted to 18 hr. 10 min. Messrs. Ivor Lusty and L. Sealy-Vidal have joined the Club as flying members, and Miss Tidey, Miss King, Messrs. Woodley, Richardson, and Hunt as associate members. On Thursday, November 5, a Guy Fawkes party was held at the clubhouse. Mr. G. Kenning, whose Miles Falcon has been housed at Tollerton during the summer, has completed 100 hours' flying in three months, piloted by Mr. John Addinsell. Mr. J. H. Radford has gone solo.

CINQUE PORTS

The new R.A.F. Squadrons are now well settled in, and when they receive their fourteen additional Hinds next week there will be a great deal of activity on the aerodrome. Lord Suirdale and Mr. R. T. Beckett have made successful first solo flights, but the weather has not permitted them to do much flying since. Club machines have flown seventy-six hours during the last fortnight, and new members include Mr. L. Thoday and Mr. F. M. Ansett.

HERTS AND ESSEX

The flying times for October totalled 355 hr. 38 min., these figures showing an increase of 146 hr. 10 min. over those for the corresponding month in 1935. Mr. F. D. Scott has gone solo and Messrs. McGregor and Sanghvi have passed their "A" licence tests. There was a large entry in the cross-country competition for the Janet Lady Brickwood Challenge Cup, Mr. Len Pyle securing the trophy, while Mr. V. A. Ercolani and Mr. H. A. Ellis were second and third respectively. Mr. A. R. Frogley and Mr. D. Nock have gone for a tour on the Continent in the Swallow. New members are Messrs. F. L. Jago, G. Barker, H. A. Crawford, B. P. Wiesner, L. E. Ball and A. H. Slaughter.

BROOKLANDS

Flying times for the past fortnight amount to 170 hr. 30 min. dual and solo, and taxi trips have been numerous. Members are asked to reserve Sunday, November 22, for the dance at 4.30 p.m. and are reminded that there will be a lecture on meteorology the following Sunday at 5 o'clock. New members include Mr. Whotton, who has started flying instruction, Messrs. F. M. Hajek, A. St. G. Harris, A. W. Whittet, T. Ezekiel and Mr. Marston. Miss Friedlander, Mr. Blundell and Mr. P. Gush have completed their "A" licence tests, while Mr. Romsey has been taking advanced dual for his instructor's ticket. Mr. Ken Waller is back at Brooklands.

SOUTH COAST

During October over 130 hours' flying was recorded on Club machines, this total being far greater than that of last year. In spite of the very heavy rain lately, the aerodrome surface has kept in perfect condition and flying has been carried on as far as the wind would permit. Any members of neighbouring flying clubs who would like to attend the annual dinner dance to be held at the Grand Hotel, Brighton, to-morrow, will be welcome.

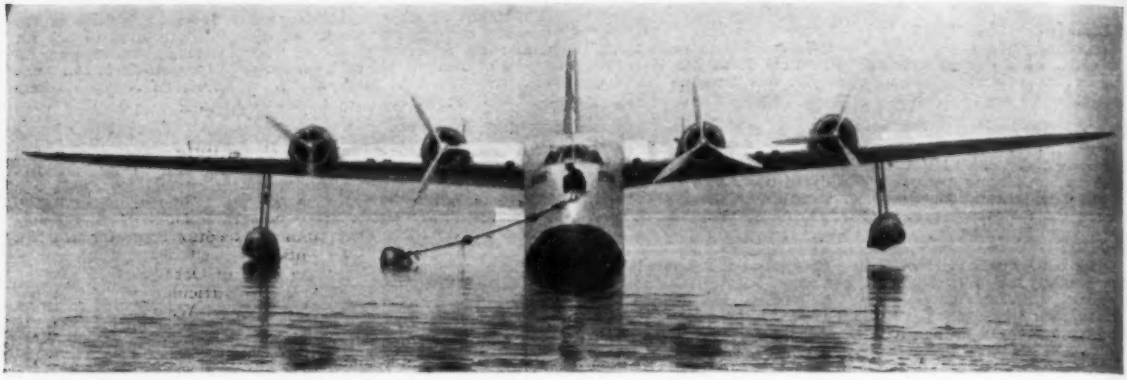
Bad weather stopped most of the flying during the past week, although a certain amount of blind-flying instruction was given. New members include Messrs. W. C. Cox, B. Campbell and G. A. Thompson.

NORFOLK AND NORWICH

During the week-end some thirty or forty members of the London and North Eastern Railway's staff were entertained at the aerodrome, and keen interest was shown in everything seen. Mr. H. D. Hesketh has made good progress during the week and likewise Mr. R. S. Dicks. Messrs. J. G. Beauchamp, J. L. Hanley, D. G. Moynihan and Lord Walpole have had refresher courses, and Flt. Lt. C. Feather continued with his advanced instruction with the chief instructor. Amongst the three hundred guests at the annual ball held recently was the President and Lady Holmes.

COMMERCIAL AVIATION

— AIRLINES — AIRPORTS —



CLEANLINESS : The entire lack of avoidable excrescences is obvious in this front view of the Short *Centaurus*, third of the Empire flying boats, some flying impressions of which appear on the following page. *Centaurus* will probably be on her way to the Mediterranean by the time this issue appears. (*Flight* photograph.)

THE WEEK AT CROYDON

High Winds and Cancellations : K.L.M's. D.C.3 : Chair Comfort : Friday the Thirteenth : Relative Safety

THE recent gales, which led to cancellations of certain services, brought grist to other people's mills. Capt. Gordon Olley, who ran several "specials" to Paris, coined the expression, "It's a strong wind that blows somebody a bit of good."

These cancellations led to some curious remarks by disappointed passengers, which, if I may say so, show which way the wind blows these days. When an evening service to the Continent had recently to be cancelled passengers were informed that, after all, the Channel boats were not operating. One passenger's reply was, "I know that; it's the reason I booked by air." In other words, it is realised to-day that, given the right aeroplane (such, for example, as the new Armstrong Whitworth A.W.27 42-seater on order for Imperial Airways, the first of which is said to be due for delivery here in February), high winds below hurricane ferocity should not affect services. Nowadays, such winds do not involve even a rough passage, since, unless severe icing conditions are to be expected higher up, the pilots climb straight off the airport to a height where bumps are virtually non-existent and where the sun always shines.

Emergency Exits

Talking of which, I hear that the constant speed airscrews and automatic pilot on K.L.M.'s new Douglas D.C.3 make the machine ride through bumps in a quite amazing manner. This aeroplane seems well liked by the pilots. Contrary to modern all-metal practice, there are three emergency exits in the cabin, besides the door, as well as one in the crew's quarters. Apparently there are two on the side where there is a double row of passengers and one the other side, where seats are in single file. The exits are simple and of a nature suggested years ago in *Flight*—if I remember rightly. The window, complete with frame, plus some ten inches of the fuselage wall, drops away when a knob is properly operated. One ought to add "Penalty for improper use, £5." The chairs are ideal; press button "A" and the back adjusts itself to military ram-rod-type figures or to those with the scholastic stoop. Button "B" adjusts the seat, apparently, to bony contours or superabundant curves. In other words, you don't have to get up and wrestle with it. One of these days someone will put a decent-looking fireside chair on the market embodying the features of such chairs as this one and the new Imperial Airway's chair, which is also the last word in comfort and convenience.

Some excitement appears to have been caused in Cologne when British pilots were suddenly searched, in case they were taking currency out of the country. Nobody minded, but one ticklish pilot roared and roared and roared, which, of course, you mustn't do when the matter is an official one.

Another Customer

Mohammed Ishan, Afghan Air Force Chief, arrived in this country from Paris by Air France last week and was met by Group Capt. R. M. Field, and hurried away to shops where they sell aeroplanes.

On Friday, November 13—ominous day and date—the Airport electric clocks stopped for a time, otherwise there was no untoward incident, except that the rain came through the special holes bored in the ceilings for the purpose. This scheme has been in operation for about a year, and speaks well for the waterproof qualities of the concrete floors beneath. People thought at first it was a temporary measure, and so it may be. It depends on one's conception of time.

I noted with admiration, tinged with awe, that, by order of the Air Ministry, fifty oak trees, believed to be hundreds of years old, are to be felled in the avenue leading to Hamble, Hampshire. It is considered necessary to do this to ensure the safety of Reserve pilots. The civil pilots, who petitioned the Authorities about certain trees on the border of the aerodrome here, and who were presumably thinking mainly of their passengers' safety, will note that there is one law for the Reserve and another for the airline passenger.

A. VIATOR.

LONG-DISTANCE LUXURY

Some Flying Impressions of the Short "Centaurus"—Third of the Empire Boat Series : The Last Word in Quietness and Comfort

THERE appears to be no doubt that an atmosphere of sheer spaciousness in an aeroplane will do more than anything else to encourage the ordinary mortal to treat air transport as it should be treated—as a normal but exceptionally comfortable means of travel.

However economical, practical, and essential the smaller types of transport machines may be for comparatively small-scale operations, or for operations over routes with light traffic potentialities, it is only in the really large craft that the ground-conscious traveller can forget his pre-conceived notions. Not only is it possible for the large machine to be silent, but it can also carry a comprehensive confidence-giving staff, and it allows the passenger to stretch his legs, so removing any idea that he is a mere portion of living freight.

From this point of view alone the Short Empire boat is one of the most important advances in air transport equipment that has yet been made. There have been, and are, larger machines and the Clippers of P.A.A. may be equally luxurious, but it is doubtful if any machine has actually exceeded the standards of comfort and quietness attained in the Imperial Airways' "C" class. The cabins are quieter than those of *Heracles* and are roomier than those of *Scylla* or of the Junkers G.38. Furthermore, it is possible to see the world fairly well from all of them, though a flying boat must necessarily be restricted in transparent areas.

When we had an opportunity of flying in *Centaurus* last week the weather, with a fairly strong breeze and occasional rainstorms from an overcast sky, was such that flying in a smaller machine over the Kent hills might have been very uncomfortable indeed. As it was, the bumps were hardly noticed, and the occasional though gentle "shakings" ceased as soon as height had been gained. Even on full throttle and fine pitch it was possible to talk without straining the voice, and later, with the motors throttled back and the airscrews in coarse pitch, one could fairly say that whatever noise there was did not impinge on the passengers' consciousness. Whether by plain aural standards or in decibel figures it is practically impossible to judge relative silence since so many factors must be taken into consideration. Judged aurally, the Short boat was quieter than any machine which we had previously experienced.

It is always difficult to estimate the take-off time with a seaplane or a flying boat since the machine is usually moving at the moment when the throttles are opened, and in this case the initial acceleration was obtained while rounding a bend in the Medway with the port engines throttled back. Eighteen seconds would be a fair figure with a very good load and the flaps, of course, partly depressed. The machine was soon on the step and, even before, was very clean during the acceleration.

The Pilot's Angle

Rigid Imperial Airways rules forbid any person, save those with a close interest in the navigation of the ship, from entering the control cabin, but, from previous examination, we know that the view from this cabin is exceptionally good and that the controls and instruments are well placed. Their disposition was described in the issue of October 29. Very few pilots have so far experienced the particular thrill of holding 4,000 h.p. in their spread right hand! We were told that the rain-flow over the "bow-window" screen is perfectly smooth, so that visibility is not appreciably impaired. On so many machines rivulets are "wedged" by the airflow, reducing forward visibility to a dangerous extent.

With a "cabin" view only, it is not easy to judge an approach, but the flaps certainly steepen this to a very marked extent, and the landing, after passing the Rochester bridge at a safe height, was short enough to please anyone. It was even necessary to taxi a hundred yards or more to the mooring opposite the main hangar—which is only half a mile or so from this bridge. The moment of touching down would not have been noticeable had it not been for the pleasant hollow "swooshing" sound of the keel as it touched the Medway. Off the step, the machine does not nose in, but retains its normal attitude; the resultant wave hardly reached the windows; and there is no uncomfortable deceleration effect.

One can but envy the many passengers who will experience this new air travel during the next few years.

To the Show

BRITISH AIRWAYS are offering a rebate of 10 per cent. on return fares to Paris, during the period of the Exhibition, to identified members of the aircraft trade. Identification should take the form of a letter from the applicant's principals stating that he is visiting the Show on business and not just visiting Paris!

A Subsidiary Problem

ALTHOUGH nothing had been finally settled at the moment of going to press, it is very probable that British Airways will purchase a number of Lockheed Electras for use on the Scandinavian mail service, pending the delivery of fast British machines for this purpose.

A subsidy, of course, is not usually offered where foreign-made machines are to be used, but the special problems in this case are discussed on p. 539. Recently the firm has purchased two more Fokker F.12s of the later type for the same service.

Canadian Transcontinental

AFTER a good deal of delay it appears to be likely now that the first trans-Canada air service will be run on July 1 (Dominion Day), 1937. As explained when the air route and its emergency landing grounds were described in *Flight* of May 2 last year, the work was begun in 1932 in order to help the unemployed and something like £1,500,000 will have been spent on the ground scheme alone before the middle of next year.

It appears now that the Canadian Government has decided to entrust two railway companies, rather than the pioneer air line company, Canadian Airways, with the operation of the transcontinental air service. A new transport commission with wide powers has been established to supervise all forms of transport.

Douglas in Europe

IN addition to the eight Douglas D.C.3s already purchased by them, K.L.M. have now ordered three more of these machines, and Swissair, as might be expected, have ordered one of this type to supplement their present Douglas fleet.

Re-equipping Air France

APART from the big Farman 224, several new types have been ordered in quite large quantities by Air France, and details of these have been given in these pages from time to time. The Farman is, of course, a development of the four-engined bomber and six have been ordered (for the London-Paris-Lyons-Marseilles route) largely on the strength of the opinions of the South Atlantic pilots, who have been very enthusiastic about *Centaur I* used on that crossing.

The largest order is for the Dewoitine 338, which carries twenty-two passengers at a maximum of 188 m.p.h.—fifteen of these are coming along. In addition, there will be six Marcel Bloch 220s as well as the Loire 47 for the South Atlantic and the Lioré 246 for Mediterranean work.

A Scandinavian Change?

IT is reported from Copenhagen that British Airways have been in touch with the Swedish A.B. Aerotransport, suggesting that their present line via Malmö should be given up and a new line via Göteborg substituted for it. B.A. are prepared to run the service on condition that they obtain a concession to carry local passengers between Göteborg and Stockholm. Aerotransport wish to maintain their Continental line via Malmö but do not mind B.A. flying via Göteborg.

Now that the Deruluft company is being liquidated and Polish air traffic companies are, for political reasons, disinterested in maintaining airlines to the U.S.S.R., the Swedish company will be left alone in the field—according to Capt Carl Florman. In a lecture to the Swedish Aero Club he also said that in addition to the newly ordered Junkers the purchase of two Douglas D.C.3s was being contemplated.

Commercial Aviation

INVALUABLE HOSPITALITY

THOSE travellers who either booked in the ordinary way by Air France, or who were members of the special Aero Show Press party last Thursday, had a very great deal for which to be thankful. The train ferry had been cancelled on the previous evening, the Channel sea-passengers had a really unpleasant time, and even Imperials threw in their hand with a wind speed of 45 or 50 m.p.h. Air France ran their services as usual—and very comfortable it was.

Our particular Wibault, leaving a stormy Croydon at 1 p.m., was flown by one of the A.F. veterans, Capt. Lauhle, and he took the machine straight up through 6,000ft. of cloud into bright sunshine and absolutely smooth air. During the two-hour flight the passengers had an occasional glimpse of a Channel largely composed of foam, and the only boat to be seen through the gaps in the clouds was obviously having a very bad time indeed.

When we eventually emerged from the clouds Paris was laid out before us, and five minutes later Lauhle made a thistle-down "wheeler" into the high wind, letting the tail down in due course. Some of the Wibaults have, like the new forty-seater Farman 224 on view at the Show, Goodrich de-icing equipment, but this one was not so equipped. For a few moments during the descent through the clouds we passed a critical temperature-humidity area and ice could be seen forming on the leading edge, but not, probably, until it broke safely away in a warmer layer did the passengers notice it at all. At no time was the layer thick enough to cause anxiety, but—let commercial machines have some form of de-icers for winter operations.

To the majority of the passengers the progress of the magnificent airport buildings at Le Bourget must have come as a surprise. Though still far from ready, they are now in use. To the north-east of the airport, too, experiments with a Lorenz short-wave approach beacon are obviously being carried out; it will be remembered that trouble was experienced with the initial installation owing to the presence of underground power cables and so forth. Le Bourget, with a maximum run of a mile and a quarter in one direction, should be an ideal airport for such approaches and the early morning newspaper machines have been brought in quite often during the past two or three years on the simple "ZZ" system, involving the use of medium-wave D/F only.

On the following day Air France gave a little luncheon to the visitors. M. Charvet, the managing director, was in the chair, and the guests of honour were Mr. J. A. Mollison and M. Michel Detroyat, the famous aerobatic pilot. The former replied to M. Charvet's speech of welcome, and the latter was also forced to his feet to make an pleasant little speech in his own tongue.

Both before and after, Air France's hospitality was boundless—up to the moment of delivery at the door of the Dorchester on Saturday afternoon.

Wacos for Tatas

ACCORDING to information from America, Tata Sons, Ltd., have ordered a Waco C-6 for use on their mail services in India. This, we understand, is likely to be the first of a series.

Blind Approach in South Africa

THE improved radio equipment which has been installed at the Cape Town airport will soon be made available at all main aerodromes throughout the Union. This new equipment includes Lorenz ultra-short wave transmitters and the usual marker beacons.

Helping the Rhodesias

FOLLOWING his offer in September of £10,000 to encourage civil aviation in South Africa, Sir Abe Bailey has now offered £3,500 to the Prime Minister of Southern Rhodesia, who has accepted the gift. It is understood that a similar gift will be offered to Northern Rhodesia.

Out of Egypt

AIRWORK'S associated Egyptian company, Misr-Airwork S.A.E., which started regular operations in August, 1933, has carried a greatly increased number of passengers in the summer months of 1936.

On the Cairo-Alexandria service, approximately 1,810 passengers were carried during June, July and August. This represents an increase of 54 per cent. on the figures for the same period last year. The newly opened Nile Valley service carried approximately 940 passengers during the same three months. The Egypt-Palestine service carried approximately 1,345 passengers, an increase of over 200 per cent. on last year's figures.

Weather Forecast in Africa

AS a result of a conference of meteorological experts held in Lusaka, Northern Rhodesia, last year—the first regional conference of its kind in the world—plans are being made for forecasting weather over Africa as a whole.

At present only certain groups of territories in Africa keep in touch with each other's weather stations, but in future these groups will exchange information.

In the new schedule British East Africa, British, French and Italian Somaliland, and Eritrea will broadcast daily weather reports from the powerful station at Asmara. A similar station in north-west Africa will broadcast collected weather information from the Western Sahara, and a third will report the weather conditions in Nigeria, the Cameroons, French Equatorial Africa and the Belgian Congo.

The international meteorological organisation in Holland has confirmed the findings of the Rhodesian Conference and it is expected that a better understanding of the dry spells, the rains and the winds of the whole of Africa will in due course be attained.

The Tatsfield Accident

IN the official report of the accident to the Sabena Savoia-Marchetti at Tatsfield, Surrey, on December 10, 1935, the Inspector of Accidents states "that the pilot over-estimated his rate of progress during the latter part of the journey and consequently descended from the clouds considerably short of his objective, and was then uncertain of his position; it is difficult to understand . . . why he did not ask for further bearings from Croydon. . . The pilot allowed the aircraft to lose flying speed and stall when executing a steep climbing turn to the left. . ."

In an additional note, the Air Ministry said that the passengers would be thrown to the front of the cabin at the stall and that the change in load position might have materially affected the pilot's chances of making a recovery.

AERONAUTICAL PATENT SPECIFICATIONS

(The numbers in brackets are those under which the Specifications will be printed and abridged, etc.).

(*Published November* 5, 1936.)

10476. BENDIX AVIATION CORPORATION: Master cylinder for hydraulic power transmission and more particularly for hydraulic brake systems (454,854).
10655. GERIN, J.: Aeroplane having a variable lifting surface (455,023).
10687. WRIGHT, G. M.: Altimeters for use in aircraft (454,931).
10827. SACHSENBERG, G.: Aircraft hangars, factory buildings and the like (454,865).
11161. MARCONI'S WIRELESS TELEGRAPH CO. LTD., and SMITH, S. B.: Radio direction-finding and directional-receiving installations (454,955).
12382. HAVILLAND, G. DE, and DE HAVILLAND AIRCRAFT CO., LTD.: Cooling of aircraft engines (454,664).
19636. HAVILLAND, G. DE, and DE HAVILLAND AIRCRAFT CO., LTD.: Aircraft and propulsion means therefor (454,983).
35206. SHORT BROS. (ROCHESTER AND BEDFORD), LTD., and GOUGE, A.: Apparatus for discharging fuel or other liquid from aircraft (454,820).
2472. AEROPLANES MORANE-SAULNIER, SOC. ANON, DE CONSTRUCTIONS AERONAUTIQUES: Aeroplanes and flying-machines (454,753).

(*Published November* 12, 1936.)

7363. ELLIOTT, A. G., RUBBRA, A. A., and FAIRHURST, L. G.: Variable-pitch airscrews (455,044).
17614. ELLOR, J. E.: Breathers for aircraft engines (455,314).
21843. SHORT BROS. (ROCHESTER AND BEDFORD), LTD., and PARKS, A. G.: Directional wireless apparatus for aircraft (455,164).
22545. BRISTOL AEROPLANE CO., LTD., FEDDEN, A. H. R., and COPLEY, J. W.: Cowls for air-cooled aircraft engines (455,248).
22546. BRISTOL AEROPLANE CO., LTD., FEDDEN, A. H. R., and COPLEY, J. W.: Cowls for air-cooled aircraft engines (455,249).
26442. DODSON, E.: Means for controlling internal-combustion engines for aircraft (455,106).
32294. SHORT BROS. (ROCHESTER AND BEDFORD), LTD., and HART, S. G.: Stiffened air-ducts (455,110).
35968. TREVOR, A. H.: Aeroplane kite (455,067).
6917. ELLIOTT, A. G., RUBBRA, A. A., and FAIRHURST, L. G.: Variable-pitch airscrews (455,074).

(*Published November* 19, 1936.)

1927. SANDERS, C.: Propulsion means for watercraft and aircraft (455,688).
8447. AVIATION AND GENERAL PRODUCTS, LTD., and JEFFCOAT, L. G.: Time-registering devices for use in aircraft and vehicles (455,380).
11994. NAZIR, P. P.: Aeroplanes and the like (455,501).
12231. DOWTY, G. H.: Retractable undercarriage for aircraft (455,384).
29492. SPERRY GYROSCOPE CO., INC.: Servo motors for use on aircraft (455,673).
31805. SOC. DES AERONEFS MIGNET.: Aeroplane (455,462).